RAILROAD GAZETTE

FRIDAY, FEBRUARY 1, 1895.

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Contributions.

Night and Day Signals.

TO THE EDITOR OF THE RAILROAD GAZETTE:

In your issue of January 25 you publish a letter from Arthur H. Johnson which deals with the much-talked-of subject, day and night signals.

Some of the premises and conclusions of that letter are so far from the facts, and might, in my opinion, prove so harmful if adopted, that I am forced by a sense of duty to enter my protest with some statement as to the conditions as I understand them. But first let me make my exceptions.

1. Although steamboats, as we build them, are not well calculated for land travel, I am told that there are some in use in Norway which perform well both on terra firma and in the water. But be that as it may, if you have ever seen a muskrat chasing himself for the pond when he saw you approaching, and if you then watched his disappearance through the water, you would agree with me that there is nothing inconsistent in believing that a certain arrangement may be successfully applied to several purposes.

2. Railroad men, as a class, are not opposed to a position-signal at night, and they never will be.

The belief is, amongst all of those that I know who hold any opinion on the subject, that a good and reliable position-signal is a thing to be desired in the very nature of things.

Whether one exists or not has nothing to do with the question, and all of the illluminated—parabolic—semaphore—blades must fight it out with the buying public, each one for itself, and the assignee for the last. But let us hope, pray,and work for a good one, which, when it is found and is proved not wanting, will, I am convinced, sweep away all of this discussion anent blue, green, purple, red, amber, etc., lights, as the rising Phoebus drives from his path the mists of the night.

And now, most Sacred Presence, speak from the mysterious depths of the editorial chair and tell us that you cannot see why there is any inconsistency in a position night signal, simply because an ocean liner, instead of landing her passengers at the pier, doesn't crawl up the bank and back up to the different hotels like a country omnibus for the purpose of vomiting its load.

LUKE FORWARD.

A School of Car Coupling.

Santa Fe, Prescott & Phœnix Railway Company,
PRESCOTT, Arizona, Jan. 15, 1895.

TO THE EDITOR OF THE RAILROAD GAZETTE:

I am not now engaged in the car coupler business, but nevertheless, take a deep interest in couplers of the M. C. B. type, and have had considerable opportunity, in this country, of observing them in service, and am satisfied that a great deal of the objection to them, and a large part of the breakage, are due to the ignorance of trainmen and yardmen, in regard to the way they work, and the general stupidity of many such employes when handling mechanical devices.

I have noticed that when making a coupling with two couplers of this kind the operator almost invariably opens both knuckles, and in addition, takes the trouble to crowd both drawheads as far over to the right as they will go in the hanger, and, as a result, when the cars come together the knuckles go outside the guard arms, and no connection is made.

Again, very frequently, when a knuckle is unlatched, the unlocking lever becomes caught on its rest, and is allowed to remain so while trying to couple, and the lock cannot act, and the stupid operator does not seem to know how to remove the trouble. I have often seen a trainman jerk and twist a lever with all his force, and then accomplish nothing, when a simple movement would have made everything right. By the time the trainman has got through with all this wrong work he is in a humor to condemn anything, and sometimes smash things. Again, when making a connection with a link to a coupler which has a central locking-pin, and of which the knuckle has been removed, the knuckle pivot-pin is used to hold the link, and, as its length is so long between bearings, the pin becomes bent, and is almost impossible to be removed; when, if the locking-pin had been utilized no injury would arise.

I believe it to be just as necessary that all railroad employes who handle couplers should learn simple rules in regard to the M. C. B. type, as that trainmen should learn rules about the air-brakes, and would suggest as some of these rules the following:

It is necessary to have but one knuckle open to make a coupling, but,

If both knuckles are open do not close one. They will act properly with one or both knuckles open.

When making a coupling with a link to a coupler having a central locking-pin, and of which the knuckle has been removed, use the locking-pin in connection with the link.

Never crowd the coupler over to one side in the hanger, unless fully satisfied that it is necessary. A coupler generally needs no such attention.

M. J. LORRAINE, C. E.

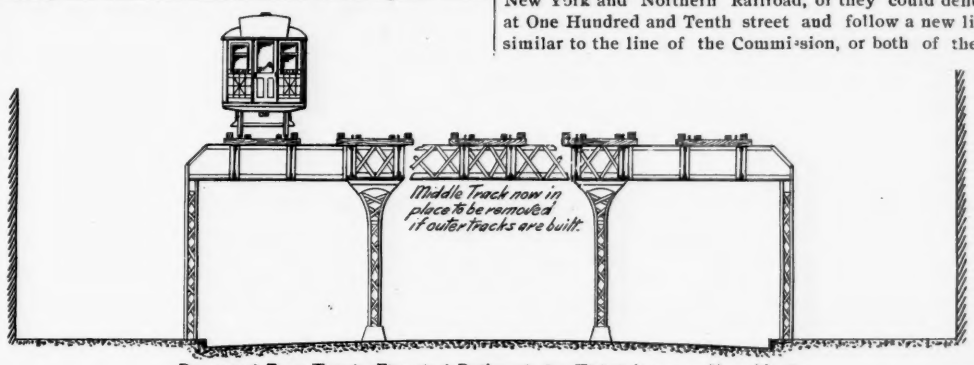
Rapid Transit in New York.

NEW YORK, Jan. 25. 1895.

TO THE EDITOR OF THE RAILROAD GAZETTE:

Probably the thing least desired, and, perhaps, least desirable, is a multiplication of schemes for rapid transit in New York City; the air is already full of such schemes, which indicates plainly that the problem is not yet solved, that the public mind is not fully satisfied with the plans already proposed.

It must, I think, be admitted, first that the engineers of the Commission are right in claiming that the work projected cannot be built for the amount contemplated; second, that while the tunnels below Union Square seem



Proposed Four-Track, Elevated Railroad, for Third Avenue, New York.

now to be located on rational lines, the location and type of construction north of that point are almost indeterminate, largely because the lines of development and greatest necessity cannot yet be clearly marked, and third, that there is an obstinate prejudice against long underground roads. They cannot be made or kept perfectly comfortable; they are extremely expensive, and they do not lend themselves easily to changes liable to come with development of business and growth of population.

Prospective changes, perhaps, not very remote, will require adaptation of any lines built to meet new conditions. We are, for example, about to absorb Brooklyn, and in so doing add to this city an area, at once more desirable for cheap homes, which is greater than the total area of this city, including the annexed district, and in which real estate is not more than one-tenth as valuable as in the metropolis. Brooklyn must inevitably be better connected with New York, and the lines of its rapid transit system must be given a foothold in New York, where location for things of this kind are limited and extremely expensive. Whether the four or more additional connections between the two cities, which are sure to follow consolidation, shall be all underground, or only a few of them, depends largely, if not entirely, on the success of the underground systems in New York City.

The third objection urged against tunnel roads leads, naturally, to the position you have steadily maintained; that the elevated railroads should first be developed to their utmost capacity, and suggests a careful consideration of Mr. Hewitt's suggestion, that the work of the Commission should be directed to some method of combining the development of the Manhattan lines with the Construction of the new lines to be built by the Commission.

Mr. Croes' intelligent and accurate collection of statistics of present travel, points to new lines near the present lines, to a new line between the east and west side lines, or to a great development of the existing Manhattan lines. It is of this development that I wish specially to speak. There is much uncertainty as to where new lines should be located above Fourteenth street; the Grand Central Depot, if permanently located, cannot fail to have formidable competitors in time, located we know not where; other features and localities now central are alike subject to the same vicissitudes with time.

There are few locations suggested for new lines below Union Square, and those last selected, along Elm street, and on a corresponding line west of Broadway, can be completed in a reasonable time to the Bridge and to the Battery, and should have loop connections, and be built underground, in view of the enormous value of streets and property down town. Suppose these lines to be built in tunnels near the surface, and with two tracks only, they might easily be used, under lease, by the express trains of the Manhattan Railway below Fourteenth street on Ninth avenue, and below Ninth street on Third avenue. From these points it would not be impracticable to get the elevated trains into the tunnels.

Although the single track express service of the Manhattan accommodates a considerable number of passengers, the proportion accommodated is, and always must be, very small indeed. It is entirely practicable to build four tracks on Third and Ninth avenues, substantially as shown in the sketch herewith; the third track would be removed from present structure when the outer tracks are ready for use. The inner tracks might be used during reconstruction, and thereafter for the slow trains, with frequent stops as now; the station platforms taking the place of the present third track, where stations are required. The extreme outer tracks supported by the existing columns, and additional columns on the sidewalk would fully provide for express service, the stations being placed preferably in the upper stories of private buildings, and having elevators if practicable. Where express and way stations occur at the same point, it is probable that these stations in private buildings would serve for both sets of trains, by use of foot bridges under the tracks to platforms, for way passengers, over the middle of the avenue. The new tracks could be supported on a stronger structure adapted to heavier engines or motors.

A little thought will convince the reader that this is the only method by which the Manhattan structure can be rebuilt, and its capacity greatly increased, without serious interruption to travel. If locomotives are used the new structure could be strong enough to secure any required speed; 60 miles an hour, exclusive of stops, would be quite feasible.

On reaching One Hundred and Tenth street on Ninth avenue the express tracks could be continued on Eighth avenue, and provide for receipt of express train from the New York and Northern Railroad, or they could deflect at One Hundred and Tenth street and follow a new line similar to the line of the Commission, or both of these plans could be followed. It is not proposed to make any change of this character on Second or Sixth avenues at this time; the latter line is short to Fifty-third street, and the former is not at present overcrowded. If it ever became necessary to establish lines of elevated railroads along the river fronts down town these could be adapted to express trains, or for both express and slow trains, from Second and Ninth avenues.

It is not, of course, a simple thing to effect the changes suggested on Third and Ninth avenues. The Commission must consent, and the Manhattan agree; new and larger latitude will be required for the use of the streets to the additional extent indicated. Both avenues are now railroad avenues, and the damage to abutting property, as measured by condemnation proceedings, could not much exceed amounts now current. The advantage to the entire city would be so great that it is possible some adjustment could be reached, by which through the aid of the Commission and the city the additional rights could be secured and the differences between the property owners and the company settled on reasonable terms. The actual cost of reconstruction would be small when compared with underground construction, and should not exceed $500,000 per mile, exclusive of equipment, while it could be completed in one quarter the time necessary to build the tunnels.

Reaching Ninth street on the east side, and Fourteenth street on the west side, the express trains would leave the avenues to enter the tunnels already referred to. Stations would be built at, say, Ninth street, and at or near the Bridge; intermediate stations in these tunnels at or near Broome street would place the stations about ¾ mile apart, which is, perhaps, a good spacing for all express stations, it should not in any event exceed one mile. There is some uncertainty as to what business these two express lines would do; it is probable that with one or two loops down town the express tunnels could accommodate one or two other express lines running on separate tracks above Ninth street.

While the tunnels below Ninth street are being built the avenue line can be completed; all within two years, and, perhaps, in one-half that time. If it becomes necessary the commission tunnels can be completed north of Ninth street, and the sub-tunnels south of that point be constructed, if it is ever desirable to run slow or local trains on the commission lines. With express service of ample capacity on the two avenues named, and with long comfortable trains running at 30 to 40 miles an hour, including stops, it is probable that local trains will not be required on the commission lines, and quite possible that these lines themselves will not, for many years, be re-

quired above Ninth street for either express or local trains.

The amount of city money required would not exceed one-fourth of that provided for to give almost immediate and complete relief and genuine rapid transit; the Manhattan would gain so largely in revenue that it should gladly make the changes in its own structure, and should be expected to pay a liberal rental for the use of the terminal tunnels.

It seems to me unwise to build the entire underground systems now proposed; they may or may not be profitable, may or may not satisfy the conditions of future development in the upper part of the island, and they may never be needed if an immediate and radical improvement in transit can be secured on existing lines.

The lines proposed along the avenues and in the terminal tunnels would, in the shortest time, not exceeding two years, and at a minimum expenditure of public money, give a substantial, and for many years, a sufficient rapid transit, capable of extension and enlargement when occasion requires; thus satisfying the just demands of a long-suffering people, and placing the Manhattan Railway where it belongs, in harmony with the public and their reasonable demands for high speed and greater comfort.

IMMEDIATE RAPID TRANSIT.

Snow Flanger Mounted on Flat Car.

The illustrations show an inexpensive, strong and serviceable snow flanger. It is arranged on a flat car which is loaded with car wheels at both ends, to give the necessary weight to hold the flanger down and prevent derailing. The house, which is put on the car to protect the operator from the weather, is not shown. There is a snow plow on one end, arranged as shown. The flanger is formed of wood and iron, and is carried just back of the front truck. It is hinged in front of the rear truck. The thrust is taken by struts leading to the transom. All this is clearly shown in Figs. 1 to 5. The arms to which the flanger is attached are made of timber 10 by 5 in. each.

The joint between the transom of the flanger and the arms is shown in Figs. 4 and 5.

The long lever *Z* is used to raise and lower the flanger when the air pressure is not available. Normally the flanger is operated by the air cylinders shown in Figs. 1 and 3. The air enters as usual through a hose from the engine and passes directly through a check valve to a large reservoir at *V*. From the reservoir it is led to a valve which controls the admission of air to and from the cylinder. Between this valve, and the air drum is a pressure gage. By admitting air to the cylinder the flanger can be lifted as desired. The lateral bracing between which the flanger slides vertically is shown in Fig. 3. There is a pin through the lifting rod connected with lever Z which holds the flanger up when not in use. It is said that this flanger works well, and is convenient to use; the cost is small, and all parts are strong and simple, and if broken can be quickly repaired.

This device was designed in the Fort Wayne shops of the Pennsylvania Lines.

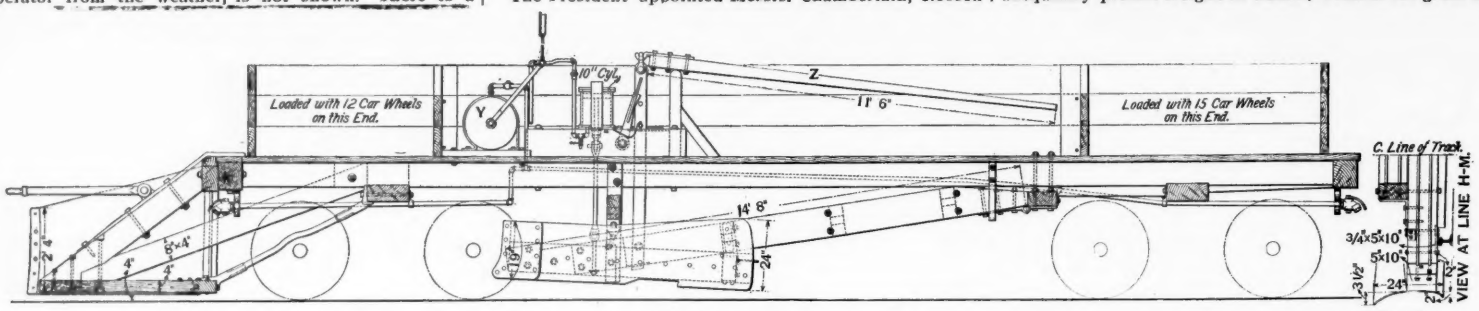


Fig. 1. Fig. 5.

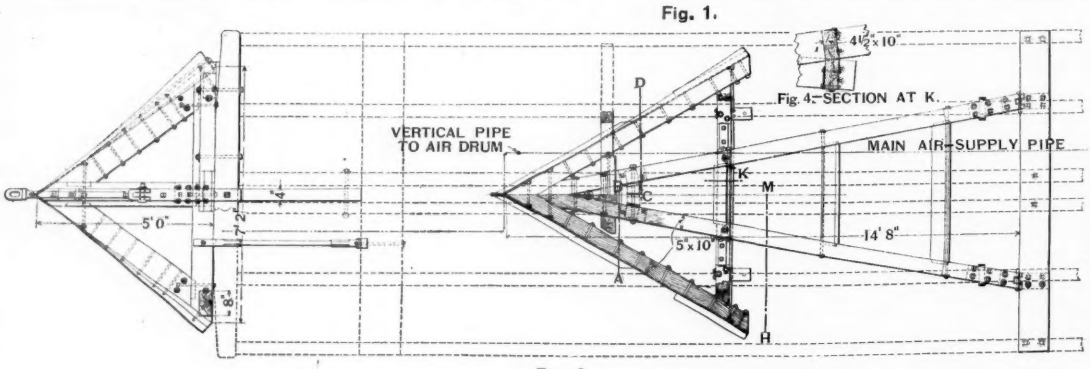


Fig. 2.

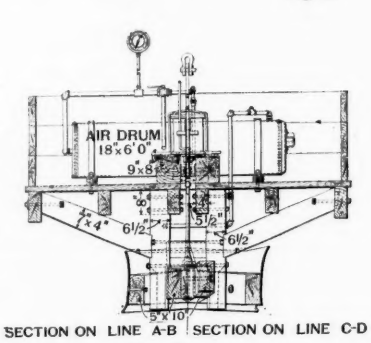


Fig. 3.

Snow Flanger Mounted on Flat Car.
PENNSYLVANIA LINES—NORTHWEST SYSTEM.

Central Railway Club.

The annual meeting of the club was held at the Iroquois Hotel, Buffalo, N. Y., January 23, with President A. M. Waitt in the chair.

The meeting opened with an address by the President. Among other remarks he suggests a revision of the constitution and by-laws, and believed that meetings should be held every two months, except during the summer, and upon such dates as would not conflict with the sessions of other clubs. The amending of the by-laws by which every other year a representative of the motive power department should be chosen president, was considered a wise one, as in the past the office had invariably been held by some man connected with the car department. Mr. Waitt announced with regret the death of Mrs. F. D. Adams.

Samuel W. Spear, Secretary and Treasurer, then presented his annual report, which showed that the percentage of gain in membership has been about the same as for the past few years. In January, 1894, the total membership was 193, which was increased by 43, and decreased by two resignations and three deaths, leaving a total enrollment at the call of this meeting of 231 members. The statement of the finances of the club is as follows:

Balance carried forward from last year		$709.20
Receipts from advertisements	$1,082 00	
Receipts from dues to date	324 00	
Receipts from dues for 1895	10.00	
		1,416.00
		$2,125.20
Disbursed for printing reports, etc.	$530.39	
Disbursed for postage	171.05	
Disbursed for stenographer and clerical aid	158.34	
Disbursed for salaries	400.00	
Disbursed for stationary, etc.	121.37	
		1,381.15
Balance in bank		$744.05

A communication from the Southern & Southwestern Railway Club, in reference to a resolution passed at its November meeting, and bearing on the subject of a revison of the rules of the various railroad clubs, was read. This was accompanied by a copy of the action of the Western Railway Club that the Secretary send a notice to other clubs, recommending that a committee in each be appointed to report at the February meeting on the Rules of Interchange, the same to be discussed at the April meeting. Mr. McKenzie moved that the communications be received, and suitable committees appointed, the same to be reported to the secretaries of other clubs.

The President appointed Messrs. Chamberlain, Robson and Sinclair a committee of three to draft resolutions expressive of sympathy to F. D. Adams in his bereavement. The committee subsequently reported an appropriate resolution, which was adopted by a standing vote.

Upon motion of Mr. Chamberlain it was ordered that a committee of five be appointed for the revision of the constitution and by-laws and that the matter of action on delinquent members be referred to that committee.

TERMINAL YARDS.

The paper on "Terminal Yards," by J. B. Morford, Superintendent of the Canada division of the Michigan Central, presented at the last March meeting, was again read by the author, who stated that the only object he had in view in its preparation was the securing of greater and improved terminals. An abstract appeared in our issue of April 6, 1894.

Mr. Coolbaugh opened the discussion, which has repeatedly been postponed, owing to the absence from meetings of superintendents. Speaking from 20 years' experience in the transportation department, and from a regard for the shipper's interest, he said it was a surprise to him that the question had not been taken up by the American Association of Superintendents, as it meant more in dollars and cents to the railroads than any subject the association has considered.

Mr. Marston said that the D., L. & W. had found that carding cars was superior to chalking, and had effected a saving of from one to one and one-half hours' time.

Mr. Wattson gave a very graphic illustration of the unsystematic method of making 15 switches with a train of 50 cars, in a terminal yard, by beginning at the head end, the operation taking one hour and ten minutes. To this he added that by the use of the poling system on his division of the West Shore, he had been able to get along with a less number of switch engines, and often found that they had siding room to spare; breakage had been reduced 80 per cent., as there was less switching, and therefore, not so much wear and tear. As a result of his experience he was prepared to indorse the poling system, and second the efforts of Mr. Morford to educate the operating forces in terminal yards. Mr. Mackenzie stated that through failure to make it pay the Nickel Plate abandoned the poling system. He thought this might possibly have been due to the construction of the yards.

Mr. Morford said that he had had the privilege of establishing a poling yard at Kensington, a suburb of Chicago, where they handled from 1,500 to 2,000 cars in 18 and 24 hours, without breaking a drawhead, whereas damage to cars had previously been frequent. He was of the confident opinion that poling would eventually be adopted by all the Trunk Lines, and that all new yards would be laid out with a view to using that system. Mr. Browner cordially endorsed the statements of Mr. Morford, and added that with the poling system at Kensington broken draw bars were almost unknown.

Mr. Maiden did not believe that a uniform practice could be adopted for the government of all roads. He believed, however, that it would tend to reduce inspection.

Mr. McCarty fully endorsed the statements of Mr. Morford. The Pennsylvania had had 10 years experience. In the beginning they had the same trouble as had been mentioned by Mr. Mackenzie; but had found by educating the men and by discipline, it was profitable to continue the system. The speed in switching cars was remarkable, and the reduction in breakage was very large. They were able to get along with from one-third to one-half the number of switch engines required under the old methods, which, if in use to-day, would render it impossible to handle promptly the immense amount of business that is being moved. The Pennsylvania gives a great deal of study to this subject, and is able to continually secure improvements in the system. He was of the opinion that the matter was occupying a good deal of attention abroad, and in France, no matter what may be the size of the yard, they use only the poling system for switching.

Mr. Morford said further that the men did not take kindly to the poling system, because it reduced the number of crews, and the men conspired to make it unsuccessful. He heard of a scheme of this kind while in Kensington, but he promptly nipped it in the bud by calling the men into his office and telling them that the first man who broke a car would be discharged.

DOOR FASTENINGS.

J. D. McIlwain, of the committee on car door fastenings, made a report supplementary to the one presented at the last meeting, accompanied by pen and ink drawings. Mr. McIlwain, at the close of his report, said that, in his judgment, a proper car door, properly hung, that will adequately protect freight in transit, without too great an expense for maintenance, was the most important question now before the car departments.

Secretary Curtis, of the New England Club, exhibited a model of a patent car door hanger, manufactured by a firm at Cambridgeport, Mass., and read a paper descriptive of the design, construction, and merits of the device. It is in practical use on a number of cars in the East. The discussion of this subject will take place at the next meeting of the club.

The election of officers resulted as follows: President, Samuel Higgins; Vice-president, E. D. Bronner; Secretary and Treasurer, Harry D. Vought. Executive Committee, T. A. Bissel, John Mackenzie, O. P. Letchworth, and George W. West, C. E. Rood and P. H. Griffin.

During the afternoon a number of the members availed themselves of an invitation to visit the Gould Coupler Works, and Superintendent Marston, of the Lackawanna, ran a special train to Depew for their convenience.

The annual banquet was held at the Iroquois in the evening, and was largely attended by the members.

The United States Timber Tests.

We have, from time to time, recorded the progress made with the timber tests that have been going on for some time, under the Forestry Division of the Agricultural Department.

The reader will remember that the physical tests are made at Washington University, St. Louis, under Prof. J. B. Johnson. A great deal of valuable information has been collected, and two bulletins have been issued by the Department and sent to every member of the American Society of Civil Engineers, and to the American Institute of Architects. Of course, the work has had a precarious life, as all work must have which depends upon yearly appropriations.

Nevertheless, it appears that the tests have been progressing during the past year more rapidly than heretofore. Tests are now being made at the rate of about 1,500 per month. A large quarto bulletin of several hundred pages will soon be issued, as a sort of final report on the strength of the four leading varieties of southern pine. This bulletin will also include the results of investigations as to the best methods of seasoning lumber, and

some special investigations on the influence of moisture in affecting the strength of timber.

Up to date, funds for this work have been provided from those appropriated to the support of the Division of Forestry, in the annual Agricultural Department bills. The tests have usually been suspended in the latter part of each fiscal year, from the failure of these appropriations' and the same will be the case this year if a special bill is not passed for carrying on the work. Such a bill, appropriating $40,000, especially for this work, was passed by the Senate in June last, and the same bill was reported by the Agricultural Committee of the House, and its passage unanimously recommended. This was in the closing days of the first session of this Congress. It now only remains for the Chairman of the Agricultural Committee of the House to call up this bill and ask for its passage, as it is well-known that the House is favorable to the continuance of these investigations. If this is not done before the close of this session, which is the 4th of March, the work would have to be begun over again, as this is the last session of this Congress. The Chairman of the Agricultural Committee of the House is the Hon. W. H. Hatch, of Mo.

Persons interested in the carrying on of these experiments could probably aid in the passing of this bill by writing to their Congressmen, requesting them to try and have the bill called up and passed. Letters addressed directly to Mr. Hatch would probably also be helpful.

If this present bill is passed an experiment station will be established on the Pacific Coast, and investigations begun on the timbers of the northwest.

Motor Cars for the Metropolitan Elevated Railroad, Chicago.

The electric motor cars now being built by the Barney & Smith Car Co., of Dayton, O., for the Metropolitan, West Side Elevated Raiload Company, of Chicago, differ in many respects from the customary practice in car building. The salient feature of the car is the steel sub-frame, which it was thought necessary to add to enable the car to pull six loaded, 40-foot trailers, and also to get sufficient weight for traction; for the latter reason no attempt has been made to lighten the construction of the car body and trucks.

The weight of this car, exclusive of all electric apparatus, is nearly 40,000 lbs., the length of the body is 40 ft; the length of the steel sub-frame, including the oak end sills is 47′ 3″; the width at sill line is 8′ 7″, and at the eaves 8′ 11″; the height from rail to top of roof is 12′ 10″.

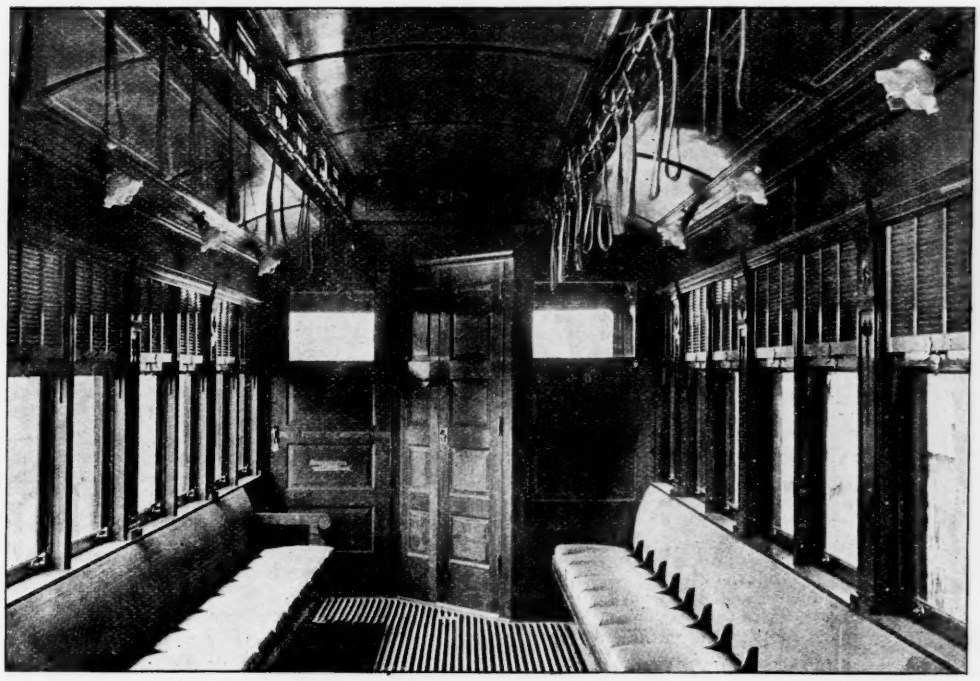
The car is constructed in the usual manner, with oak end sills, and six longitudinal, long-leaf, yellow pine sills and stringers. The end frames are provided with iron plates at sill, plate and uprights to prevent telescoping in case of collision. The motorman's cabs, of which there are two, are in diagonally opposite corners, and are built out on the platform as far as the hood will permit. This construction necessitates the location of the entrance doors next to the corner posts, and as it was thought desirable to have them of the sliding type, they are pushed back into the cab, which, however, does not interfere with the motorman, as the front door is always locked.

The exterior is sheathed with narrow, beaded poplar in the usual manner, is painted a dark brown shade, with handsome decorations in gold leaf. The platform railings and gates are of the usual elevated car type.

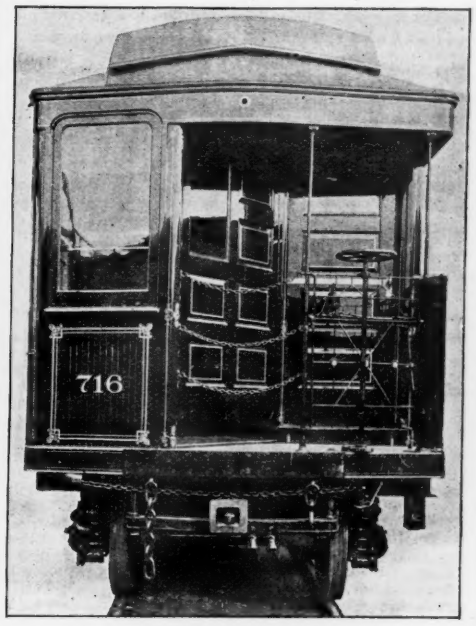
The interior of the car, with the only exception of the window blinds, which are linwood, is finished in quarter sawed oak, with a liberal amount of carving, thoroughly varnished, hand rubbed and polished. The seats are arranged at the sides and covered with rattan.

The cars are to be electrically lighted with an ample number of incandescent lamps, which are placed at the bottom edge of the lower deck ceiling so as to be directly above the seats. The warming in winter will be provided for by a number of electric heaters so arranged in series that the temperature can be kept up to the proper degree.

These cars are equipped with quick-action air brake apparatus. The required compressed air is carried in a storage tank, provided under each car, which tanks will be charged from a conveniently located plant.

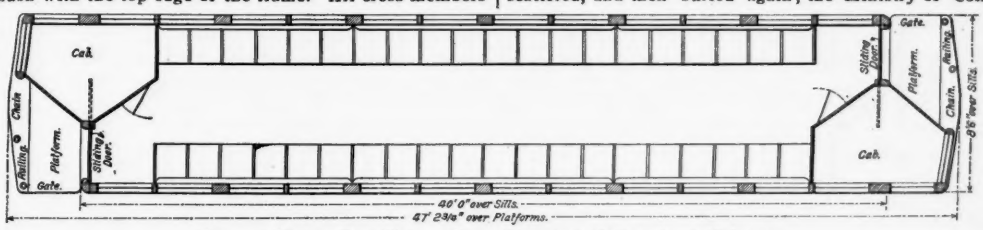


Motor Car—Metropolitan Elevated Railroad, Chicago.



Metropolitan Motor Car.

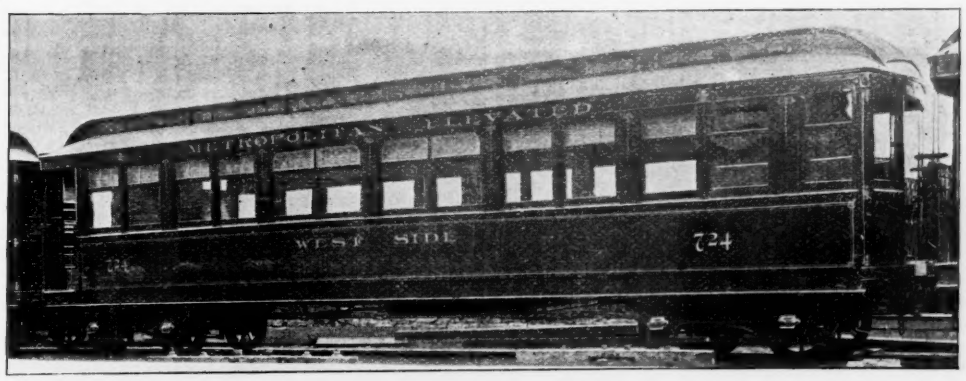
The steel sub-frames are constructed with two 9-in. I-beams, immediately under the side sill of the body. They are connected at the ends by 9-in. channels, to which oak buffer timbers are attached. A $\frac{5}{16}$-in. stiffening plate secured by rivets to the end channels, and I-beams extends across the frame end, under the end-sill of the car body. This also forms the foundation for the platform floor. The body bolsters are part of this sub-frame. They are box-shaped, being built up with 9-in. channels, and ½-in. plates. Corresponding in location to the needle beams of ordinary cars are 6-in. I-beams, placed flush with the top edge of the frame. All cross members are coped where they meet the 9-in I-beams, and are secured to these with proper connection angles. The sub-frame is supported horizontally by a pair of 1¼-in. truss rods, which are anchored to the bolsters, and pass under substanial queen posts attached to the frame at the intersection of needle beams and side beams.



Plan of Motor Car—Metropolitan Elevated Railroad of Chicago.

The couplers are attached to forged brackets secured to heavy radiating bars, which are located immediately underneath the $\frac{5}{16}$-in. stiffening plate above mentioned. One end of these raidating bars passes through a slot provided in the bolster and engages with a turned king bolt, and the other end is carried by a 4-in. I-beam, extending across the frame for this purpose. The arrangement is, perhaps, not the strongest, but as the space underneath is limited, owing to the presence of the electric motors, it is probably the best under the circumstances.

The trucks on which these cars are mounted are a departure from the usual practice. They are somewhat on the lines of an engine truck, and equal to it in workmanship, but better provided with springs. It is difficult to describe this truck in the absence of working drawings.



Motor Car—Metropolitan (West Side) Elevated Railroad, Chicago.

Foreign Railroad Notes.

The Belgian State Railroad are going to check their commuters, so to speak, in order that the conductors may distinguish them more easily; a sort of metal button, with the number of the class on it, is to be worn in a buttonhole.. What the horny-handed son of toil who rides in his shirt sleeves will do with his button we are not told; it might be fitted with a pin for him. The tickets are to be retained as now, but they will not usually be called for.

It having occurred that in excavating for railroad construction in Austria, Roman graves containing objects of archæological interest have been uncovered, the contents scattered, and then buried again; the Ministry of Commerce orders that when such discoveries are made, a government official in charge of such finds shall be notified immediately, and the objects left to be excavated and examined by experts.

On the Semmering road, in the Austrian Alps, certain freight trains have a passenger car attached to carry school children from the Semmering station and the cabins of the road watchmen along the line to schools established for them at two stations on the line.

In Dessau, Germany, a street railroad is worked with gas motors of Lührig's design, which are said to work very well. The cars are similar to a one-horse car, and carry each a 7-horse-power motor and three cylindrical holders of compressed gas, sufficient for a run of 7 miles. The apparatus is completely out of sight.

The Northern Russian cities obtain their supplies of meat almost exclusively from Southern Russia, and the lack of a market for meat raised in the interior is said to

have made cattle growing so unprofitable there that the number of animals has greatly decreased, so that the land is depreciating for lack of manure. The Ministry of Finance is said to charge this to the live-stock freight rates, which are not according to weight, but per head of cattle, whatever the weight. Now the average weight of the Southern cattle is over 1,400 lbs., while that of those raised in the interior is only about 700 lbs. Consequently it costs less to send a given weight from the distant Southern steppes to St. Petersburg or Moscow than from the nearer interior. It seems incredible that this should have just been found out, but it is said that only now are preliminary steps taken to establish a more rational tariff.

Fuel Saving on Railroads.

At the last two meetings of the Western Railway Club the question of fuel saving has been considered, and those who are trying to pay dividends in these times may in the discussion find something that is worth thinking over. Mr. William Forsyth, Mechanical Engineer of the Burlington road read a paper on "The Heat Value of Western Coals," which was noticed in the *Railroad Gazette* December 28, 1894, p. 887, and further extracts are given below:

To illustrate the vast amount of coal used by the railroads, and the cost of this item in proportion to other expenses, I will give some statistics from the accounts of the C. B. & Q. R. R. The relative proportion of the principal items in cost of engine service, as an average for ten years—1883 to 1893—is: Fuel, 30.7 per cent; wages, 39.0 per cent.; repairs, 27.6 per cent.; miscellaneous, 2.7 per cent.; total, 100.0 per cent.

The total amount of fuel used on the C. B. & Q. R. R. in the year 1893 was 925,270 tons, costing $1,291,108. An idea of this vast amount of coal may be realized when it is stated that it is twice the whole amount of coal consumed in the city of Chicago in the year 1893 by all her industries and in all her heating and power boilers.

The consumption of coal by locomotives in the United States in the year 1893 amounted to 50 million tons, or about one-third of the whole production of bituminous and anthracite coal in this country.

Coals present a remarkable example of a great staple whose market values are arbitrary. Inferior coals should not command the same price as superior coals in the same market. Fuels do not take their standing in the market from constituent units. Iron masters buy iron ore by the per cent. of iron they contain, and the same is true of copper, lead, and silver ores. The principal reason why coal is not put on a similar basis is the difficulty in getting an average sample, and because laboratory methods are not more generally used. The value of a coal is not wholly dependent upon its per cent. of combustible matter, but varies with the relative per cent. of water, sulphur and ash, and it is also necessary to confine comparisons to coals containing nearly the same relative per cent. of volatile matter and fixed carbon.

The methods used for determining the heat value of coal are: 1st., Chemical analysis; 2d, calorimeter test; 3d, test on small boiler; 4th test on a large scale on locomotive.

The following table, giving the per cent. of ash in the Illinois coals, and the heat value determined by the calorimeter, in the C. B. & Q. laboratory, shows in a striking manner the difference between a lump of clear coal and the average quality of the same coal. The second column shows the small amount of ash, and the fourth column the high efficiency of the selected lump, while the first and third columns show the high per cent. of ash and the low efficiency of the average sample taken from all parts of the car:

TABLE I.—ILLINOIS COALS.

		Per Cent. Ash.		Efficiency.	
		Average.	Select.	Average.	Select.
Streator	C. W. & V. Coal Co.	8.	....	100.0	...
Streator	Star Coal Co.	10.4	....	99 0	...
Streator	Star Coal Co.	....	2 67	....	114.4
Peoria	Consolidated Coal Co.	11.44	....	99 0	...
Peoria	Consolidated Coal Co.	....	7.0	....	102.7
Edwards	Howarth & Taylor Bros	13.55	...	96.5	...
Edwards	Howarth & Taylor Bros	...	6.5	....	107.2
St David	Whitebreast Fuel Co.	17.0	....	96.0	...
St. David	Whitebreast Fuel Co.	....	5.3	....	107 8
Dunfermline	Whitebreast Fuel Co.	19.0	....	91.2	...
Dunfermline	Whitebreast Fuel Co.	...	6.5	....	105 0
Bryant	Whitebreast Fuel Co.	22.0	....	86 5	...
Bryant	Whitebreast Fuel Co.	....	9 32	....	103.0
Elmwood	Elmwood Coal Co.	35 5	....	76 8	...
Elmwood	Elmwood Coal Co.	....	15 0	....	96.2

The directions for collecting samples of coal for analysis at the C. B. & Q. laboratory are as follows:

Two samples should be taken, one marked "average," the other "select." Each sample should contain about 10 lbs., made up of lumps about the size of an orange, taken from different parts of the dump or car, and so selected that they shall represent as nearly as possible, first, the average lot; second, the best coal.

When the approximate value of a coal is found by its contents of combustible matter, the actual value for boiler purposes is not exactly proportioned to this percentage, for a deduction must be made for increased cost of firing and removal of ash, since with every reduction of fuel elements, a corresponding increased amount of coal must be burned to make the same quantity of steam.

The following table for stationary boilers based on the fact, has been made by Mr. H. M. Chance. The cost of firing is taken at 6⅓ per cent. of the cost of the coal, and it averages this for coal at $3 per ton, and labor at $1 per day. The cost of handling ashes is taken as double the cost of firing coal:

Per cent. fuel.	Increased cost of firing and removing ashes.	Value. Ratio.
94	1.28	92.7
92	1.74	90.3
90	2.22	87.8
88	2.72	85.3
86	3.26	82.7
84	3.80	80.2
82	4.38	77.6
80	5.00	75.0
78	5.64	72.4
76	6.32	69.7

The analysis of coal is one of the simplest and easiest determinations made in the laboratory, and I believe if this fact were more thoroughly realized, that the purchase of coal would be regulated more by coal analysis. A bright boy, with an ordinary education, could in a few days learn to make the principal determinations in a coal analysis. The volatile matter and coke can be determined in ten minutes, and the separation of coke into fixed carbon and ash requires from one to two hours, depending on the per cent. of ash, a large per cent. of ash requiring the longer time.

During the year 1893, the C. B. & Q. laboratory, at Aurora, analyzed quite a large number of samples of coal, and the results of the principal ones are given in the table here appended. The Illinois coals were all collected by one of the laboratory chemists. The other coals were sent in by different parties. Of the Illinois coals those marked "average" represent the average quality of the coal in the car. These marked "select" are the analysis of a small lump of the best looking coal in sight. Where there is a great difference in the results between the "average" and "select" sample, the quality of the coal shipments could probably be improved by picking the coal before loading onto the cars. The pounds of water represent the amount of water one pound of coal could evaporate if all the heat were used. The test was made in a Thompson calorimeter. In actual practice only about half this efficiency can be obtained. The efficiency represents the heating value as compared with the heating value of Streator coal taken as 100 per cent. This 100 per cent. is the mean result of our average Streator samples.

From it will be seen that the coals in each different State have a peculiarity of contents of ash and moisture, and a specification for coal from any particular coal field must have some reference to its predominating composition, but after a number of samples have been analyzed it will be easy to see how high the per cent. of fixed carbon can be placed, and how low the per cent. of ash and moisture.

Where there is difficulty in getting samples to represent the average quality of coal, and a more exact heat value is required, a resort must be made to physical determinations on a larger scale, and of a test boiler. At the principal shop on any road where a small stationary boiler may be used, this boiler could be fitted up for testing purposes, and equipped with conveniences for measuring water and coal, the temperature of the gas, and the pressure of the draught.

A coal test on a still larger scale is that made by measuring the coal and water used on a locomotive, and getting a sufficient number of trips under conditions as nearly constant as possible, so as to get average results which will be compared with other tests. In 1885, the B. & Q. R. R. Co. made an exhaustive series of tests of this kind for all the Illinois coals that were then used, and the results are given in the table below. The comparison of the actual heat value of the coal and the price charged for it, as shown in the last two columns, is interesting, and illustrates the importance of the purchase of coal on a basis of its real value, as I have here advocated.

Having given the composition of various coals and the methods of determining their heat value I propose, as a preliminary step to the commercial grading of coal, based on its fuel value, a specification for Illinois coal which will be about as follows:

SPECIFICATION.

The sample to be taken as per specified instructions, and to represent as nearly as possible the average run of the coal.

TABLE V.—COAL TESTS ON THE C. B. & Q. WITH FREIGHT ENGINES.

NAME OF ENGINE.	Lbs. Water Evaporated per lb. Coal.	Comparative Evaporative Value Streator Coal taken as Unity.	Cost at Mine.	Actual Value.
Streator	5 65	1.000	$1.30	$1 30
Kewanee	4.09	.724	1.45	1 05
Galva	4 48	.793	1.25	.99
Edwards	4.37	.773	1.15	.89
St. Davids	4 76	.842	1 15	.97
Elmwood	4.81	.851	1.30	1.11
Norris	4.58	.811	1.15	.93
Kramm's	4 50	.796	1 15	.92
Colchester	5 63	.996	1.875	1.87
Cleveland, Ills	5 05	.894	1.50	1 34
Astoria	5.15	.912	1.20	1 09
Winchester	5.02	.888	1.525	1.35
Belleville	5.29	.937	1.25	1.17
Mendota, Mo	4.65	.823	1.30	1.07
Carver	5.03	.890	1. 0	1.16
Albia	5.20	.920	1.40	1.29
Whitebreast	4.94	.874	1.45	1 27
Jumbo, Penn	7.25	1.283	....	....

The hardness should be sufficient to admit of a haulage of at least 300 miles without making more than 1 per cent. fine slack.

TABLE IV.—REPORT OF COAL ANALYSIS MADE AT C. B. & Q. LABORATORY IN 1893.

Locality.	Average or Select.	Moisture.	Volatile.	Fixed Carbon.	Ash.	Lbs. Water.	Efficiency.	Remarks.
Illinois Coals.								
Buckheart	Average.	6.14	29.94	46.27	17.65	10.62	89.3	
"	Select.	8.92	33.52	48.06	9.50	11.66	98.1	
Bryant	Average.	2.42	32.91	42.64	22.03	10.29	86.5	
"	Select.	3 88	38 05	48.75	9.32	12.25	103.0	
Canton	Average.	3.51	36.99	46.69	12.81	11.33	95.3	
"	Select.	4 40	38.32	48.09	9.19	11.94	100.4	
Claire	Average.	3.16	32 94	43.05	20.85	10.34	86.9	
"	Select.	5 27	37.30	48.21	9.22	12.21	102.7	
Cuba	Average.	4 17	36 38	48.62	10.83	11.77	99.0	
"	Select.	6.59	35.85	49.91	7.65	11.99	100.8	
Dunfermline	Average.	2.46	32.91	45.57	19.06	10.84	91.2	
"	Select.	3.54	37.59	52.37	6.50	12.49	105.0	
Edwards	Average.	1.90	34,48	43.62	20.00	10.29	8.65	
"	Select.	5.04	33.96	49.56	11.44	11.44	9.62	
"	Average	3 20	35 48	47.77	13.55	11.33	95.3	
"	Select.	4.08	38.24	52.17	5.51	12.75	107.2	
Elmwood	Average.	1.36	27 69	35.41	35.54	9.13	76.8	
"	Select.	1.90	34,70	48.23	15.17	11.44	96.2	
Farmington	Average.	3.41	33.88	45.89	16.82	10.84	91.2	
"	Select.	6.17	35.96	48.49	9 38	11.94	100.4	
Ladd	Average.	8.49	33.63	44.12	13.76	11.17	93.9	
"	Select.					11.72	98.6	
Norris	Average.	7 10	32.12	49.74	11.04	11.06	93.0	
"	Select.	7.49	35.19	54.45	2.87	12.82	107.8	
Peoria	Average.	3 22	36.13	49.21	11.44	11.77	99.0	
"	Select.	3.18	39.24	50.56	7.02	12.21	102 7	
Pottstown	Average.	4 58	35.52	45.52	14.38	11.17	93.9	
"	Select.	5 51	35.92	49.76	8.81	12.05	101.3	
St. David	Average.	2.00	34.60	46.20	17.20	11.11	93.4	
"	Select.	3.07	35.88	52.59	8.46	12.27	103.2	
"	Average.	1.50	33.77	47.67	17.06	11.44	96.2	
"	Select.	1 38	37 42	55.89	5.31	12.82	107.8	
Streator	Average.	4.45	39.19	44.05	12.31	11.80	99.3	Mean lbs. water of No. 4854, 5010, 5016 and 5018=11 89.
"	Select.	2 16	40.20	54 97	2.67	13.61	114.4	
"	Average.	8.30	37.63	45.93	8.14	11.88	100.0	
"	Average.	8 40	38 25	47.10	6.25	12.14	102.1	
Vicary	Average.	5.78	36.60	47 14	10.48	11.94	100.4	
"	Select.	7.40	36.26	51.61	4.73	12.65	106.4	
Iowa Coals.								
Hiteman		4.99	35.27	25.37	34.37	9 27	77.9	
Keb		9.81	37.49	44.75	7.95	11.88	100 0	
Flaglers		9.29	38.86	39.97	11.88	11.06	93 0	New mine.
"		9.84	40.16	37.69	12.31	11.22	94 3	
Chisholm		9.18	40.42	39.58	10 84	11.77	99 0	
Missouri Coals.								
Brookfield		4.34	40.27	50.60	4.79	.....	.....	Sulphur 4.44 per cent.
Mendota		9.03	37.48	46.24	7.25	11.85	99.6	Sulphur 5 57 per cent.
Hamilton		5.27	38.09	51.88	4,76	13 09	110 2	Tom Creek mine.
"		5.06	34.24	47.69	13.01	11.55	97 1	
Lingo		7.33	38.29	47.24	7.14	12 43	104 4	
Nebraska Coal.								
Hastings		0.21	27.82	60.88	11.09	13,39	112.6	Sulphur 0.52.
Wyoming Coals.								
Cambria		4.2	40.6	41.5	13.7	.....	.....	Jumbo mine, best 6-ft. vein, sulphur 4.4 per cent
"		4.0	36.0	37.7	22.3	.....	.....	Jumbo mine, grey splint, sulphur 4.07 per cent.
"		2.5	37.4	37.9	22.2	.....	.....	Jumbo mine, black splint, sulphur 4.75 per cent
Goose Creek		9.7	40.2	46.3	3.8	.....	.....	Burgess mine, sulphur 0.57 per cent.: lignite.
"		13.3	39.3	44.2	3.2	.....	.....	Grinnell mine, sulphur 0 49 per cent.; lignite.
Deek Creek		12.8	35.9	47.7	3 6	.....	.....	Sulphur 0.39 per cent.; lignite.
Sheridan		6.04	42.37	35.57	16.02	.....	.....	Burgess mine, sulphur, 7.90 per cent.; lignite.
Goose Creek		12.42	40.25	43 68	3.64	.....	.....	Grinnell mine, sulphur 0.65 per cent.; lignite.
"		13.92	36.78	42 03	7.27	.....	.....	Sulphur 0.36.
Felix		16.24	35 39	40.55	7.82	9.41	79.1	Lignite.
"		15.17	38.14	40 91	5 78	9 41	79.1	Better looking sample than preceding.
Awada		14.32	34.45	48.15	3 08	10 40	87.4	
Miscellaneous Coals.								
Edwards		6.64	34.71	40.74	17 91	10.84	91.2	Mine run, lump.
"		5.98	30.43	34 89	28 70	9,41	79.1	Mine run, medium.
"		9.34	28.95	35.03	26 68	9.35	78.6	Mine run, fine.
"		5.85	35.64	42.47	16 04	11.11	93.4	Mine run, lump.
"		6.29	32.71	41.35	19.65	10 73	90.4	Mine run, medium.
"		9.54	32.18	35.31	22.97	9.96	83.8	Mine run, fine.

The fixed carbon should be as high as possible, and the ash and moisture as low as possible.

Average samples will be taken from any shipment, and will be subject to chemical analysis.

The following is the desired composition:

Moisture, not more than 5 per cent.; volatile matter, not more than 35 per cent.; sulphur, not more than 2 per cent.; ash, not more than 10 per cent.; fixed carbon, not less than 48 per cent.; total, 100 per cent.

The nature of the ash, and tendency to clinker, will be taken into account.

By calorimeter tests samples should evaporate 12 lbs. of water. In a small stationary boiler the coal should evaporate 8 lbs. of water from a temperature of 212 degrees F., in locomotives using not over 100 lbs. per sq. ft. of grade per hour, 6 lbs. from a temperature of 212 degrees F.

It was my intention to investigate the progress which has been made in coal burning on locomotives in the past ten years with respect to boiler construction, fire-box grate and draft appliances, as well as methods of firing, but I find the difficulty of getting exact figures for such comparisons is great, and in many cases impossible. Few railroads weigh the coal used on locomotives, and

so long as this is the case, locomotive records are of little use in ascertaining what progress is being made. Again, the weight of the trains hauled is very indefinite, and pounds of coal per car mile, or miles per ton of coal, cannot be used for exact comparisons. I believe that our roads will soon adopt a rating of trains in tons instead of cars, and then a closer approximation to the actual work done can be made, as reports will show coal used per ton mile.

I suggest as a matter for profitable discussion: 1st, Are we making any progress in economical coal burning? 2d, How can it be most easily and exactly shown from yearly accounts? 3d, What is the best method of showing fuel consumption so as to properly grade the performance of the engine men? 4th, Will it pay to keep records in sufficient detail to show what we are actually doing in this direction?

Mr. S. P. Bush, Superintendent of Motive Power at Columbus, O., of the Pennsylvania lines west of Pittsburgh, read later a paper on "The Economy in the Use of Coal by Railroads." The following are extracts:

As a rule, the fuel or coal account of railways is the largest single item of expense, with the exception of labor. It is not uncommon for this expense during the period of a year to reach a sum that must be expressed in six or seven figures, and this being the case, a saving of five, ten or fifteen per cent. would be most desirable; and the assurance can safely be given that such savings are entirely possible, in the majority of cases, at least. The economical use of fuel is generally the responsibility of the mechanical department.

It would be difficult to see how a thoroughly modern locomotive could be improved to the extent of increasing its efficiency ten, or even five per cent. From a purely mechanical standpoint, therefore, the matter has been very thoroughly considered. But besides the efficiency of the coal and the engine, there is another factor, viz., the efficiency of the men who handle the coal and operate the engine, which we are often apt to lose sight of and to which your attention is invited in this paper. Almost everyone who has the care of locomotives, or locomotive performance, has no doubt at some time observed that in every day practice much waste of coal takes place through the lack of careful attention of engineers and firemen. In most cases it amounts to 15 per cent. of the total consumed. Some roads have a traveling engineer whose duty it is to instruct the men. But it is impossible for him to be with them every day or every week, and when the restraint of his presence has been removed the men drift back to their average work. There is a vast difference in the performance of different men. From carefully kept records of the daily performance of over 1,000 enginemen it has been found that the average is fully 15 per cent. below the best, and in some individual cases is as much as 40 per cent. below the best. It has been found that the best can easily maintain a standard 10 per cent. higher.

Saving can best be effected by education and discipline, and by enlisting the hearty co-operation of the enginemen.

First. It is necessary to keep accurate records of each man's work, which can be used as a constant check.

Second. Establish fair standards of what should be done.

Third. Offer some inducement to the men for improving their work.

Fourth. Let every man see what he and his fellows are doing by posting in proper places monthly reports.

It is a simple matter to weigh or measure the amount of coal that is put on locomotive tenders.

With proper records of the average requirements of the different classes of work, it is simple to set the standards. These would be expressed as pounds of coal per car mile, or ton mile, after first deducting a quantity which an engine alone would require. This latter deduction is necessary on account of the necessity of having the standard on rate per car independent of the number of cars hauled. Different rates will, of course, have to be established as the work per car is greater or less.

There should be a thorough understanding among the men that their future with the company depends largely on their good performance. It is right that those who rise above the standard should receive additional compensation, and this can be given in the way of some part of the saving they have effected, for instance, one-fourth to the engineer and one-fourth to the fireman, leaving one-half to the company.

The records of the men should be made public. The influence that this exerts is considerable. It becomes a matter of much pride on the part of some of the men to see that success has attended their efforts.

The manner of collecting the information for the record on our road is as follows: Each engine is provided with a coal book of coupons and stubs. Upon arrival at the end of the run the coal remaining is ascertained as already indicated, and this, with the additional coal given, is entered on the first stub. If more is taken by the crew on the run out, it is also entered on the stub, and on one of the coupons, which latter is removed and given to the man in charge of the coaling station where the coal is received. At the end of the run one of the hostlers, or coal wharf men, takes the measurement of that which is left, and enters this also on the stub. He fills out the last coupon showing the total coal received by the crew and that remaining, receives the signature of engineer with train number, and detaches the coupon, which is forwarded to the proper place. The coal left on the tender being shown on the stub, and a known quantity being added, and also entered, the next crew taking the engine know how much they start with. It is here supposed that the same crew does not always have the same engine, but this makes no difference.

All coupons are forwarded to the same point, and at the end of the month are worked up in connection with the car and engine mileage for the monthly report, which shows the performance of each man. Waste at the safety valve is stopped, steam is used expansively, there is more careful firing, and less smoke, unnecessary movement or stoppage of trains is avoided, and many ingenious methods are resorted to that men will find and carry out only when prompted by voluntary impulses.

Some objections may be urged against such a system; for instance, it may be said that engineers will not make time with trains. Of this it need only be said that if such should be the case, it could be very easily checked up; but such is not likely to occur, for the reason that the necessity for making time in running trains is so thoroughly understood as to render any letting up in this respect almost impossible. It may be argued that the principle of paying for endeavor above the average is not correct—that a man is paid for doing his best work all the time. Of this it may be said that the principle of exact payment for services rendered would seem to be entirely right, and much better than throwing a lot of men together in one class and placing all on the same level. It is certainly right and better to pay each individual in proportion to his worth. It may not be entirely within the jurisdiction of the mechanical department of all railways to inaugurate such measures for economy, but under any circumstances it would be entirely within its province to suggest it, and to co-operate in carrying it out. This department, as stated before, is usually accountable for economical coal consumption, and it would seem entirely right for it to present any device by which a saving may be effected. If the will and energy of 100 or 1,000 men can be enlisted for the accomplishment of some purpose, the force is certainly a powerful one, and there is no doubt but that something must be accomplished.

Most all railways keep careful records of carwheels and axles, and keep a careful check of most all materials used and their performance. Why then should not the very large use of fuel be carefully checked, as more of importance than all the performances of employees to whom is intrusted the use of valuable materials.

It is thought that it is not unreasonable to conclude that this very important matter is often overlooked, and that while we are attempting to improve in some directions, we are losing more in others.

It may be stated here also that there are many indirect advantages that will come from the more careful operation of locomotives as above indicated. Engines will give better service generally, and the frequent complaint of no steam and leaky flues will be much abated.

DISCUSSION.

MR. LYON (C. G. W. Ry.): Such a system as is spoken of in Mr. Bush's paper has been in effect on the Chicago Great Western Railway for some months. Our trains are made up in the yards and handled by the dispatchers on the actual tonnage basis, and not by loads and empties, so that we are enabled to obtain directly and very easily the ton mileage of every train. We have very much the same system for arriving at the amount of coal used on each run, and we determine the coal used per ton mile of total train on every trip. We also have established a coal rating or allowance on every division, for each direction, and for every class of train. The total performance sheets posted in the roundhouses show the number of tons of coal each engineer and each fireman have consumed during the month, the number of tons of coal they should have burned, according to our established rating, and the number of tons in excess of the allowance and the percentage of excess, and the men are given to understand that a continued poor record will not be tolerated. This plan has had a very marked effect on the handling of coal by the men. So far the average percentage of excess has been in the neighborhood of 50 per cent. We purposely put the rating rather low; still the rating is within the limits of possibility. There are some men who get within the limit on certain trains. We find, however, that on certain other trains we have pitched the allowance too low, which accounts to some extent for the large average percentage of excess. The rating or basis of consumption is from .7 to 1.2 tons of coal per 10,000 ton miles of total train, or about 2.2 to 3.8 oz. per ton mile. A class is established for way freight, time freight, accommodation, express and limited trains. There is a separate allowance on each division, and for each direction on each division. To get the weight of coal we have, in the first place, established a certain capacity for the different tenders—for instance, a certain engine of a certain class will carry six tons, and the coal men are instructed to coal the engines to that limit. Then on arrival at destination the amount of coal received, usually measured by buckets (we know how much it weighs to the bucket), is deducted from the capacity of that tender, and the result is considered as the amount remaining in tender on arrival. We have a special report from roundhouse foremen, on which this information comes daily to my office, covering the complete trip of an engine, and including the coal that is taken at intermediate points. It so happens that the amount of coal used per month, as accounted for in this way, independently of the fuel agent, has been within 5 per cent. of the latter's figures, showing, it seems to me, a remarkably close agreement. From the fact that certain trains, which, for any reason, are not taken through to their destination are not entered in our total, and that we do not include work trains, the amount of coal which we account for should be less than that shown on the books of the fuel agent, this having always been the case. Any shortage of coal in comparison to the amount purchased is a matter lying with the fuel agent alone, and is not considered in my accounts, which attempt to show the actual coal in the tenders.

MR BARR (C. M. &. S. P): We have a little device that was gotten up by our Mr. Phillips, who has charge of the coal accounts, that is a good thing. We used to have little green and red tickets with a figure stamped on and sometimes the engineer would have the tickets that belonged to his engine and sometimes he would not. This present arrangement is in book form. There is a stub in the book that remains there for the engineer's record. The ticket is marked one bucket, two buckets, etc., up to fourteen buckets, and the other side in the same way. There is an address on one side to the Superintendent of Motive Power, West Milwaukee; on the other side to the Fuel Accountant at Chicago. The engineer if he takes six buckets, for instance, will fold and tear off at that point. That part goes to the fuel accountant; he looks at it and he finds six buckets. The other part is sent to the Superintendent of Motive Power. He looks on the other side and finds six buckets. There is no opportunity to get away from reporting properly. The book itself—about 100 cards—belongs to the engine, and bears the engine number, and the cards are also numbered consecutively. The absence of one of the consecutive numbers will show that there is something wrong. Last month, I believe, out of 13,000 cards turned in, there were thirteen missing. [This ticket will be shown in the *Proceedings* of the club].

MR. QUAYLE (C. & N. W. Ry.): We use the coupon system. We have a book and each engineer is given a book and the book is given a number. For example, if an engineer has book No. 20, the stub will be stamped with No. 20, as also will be the coupons. He will call for so many tons of coal, which he will have written upon the coupon and deliver it to the fuel agent for the coal received, and then he will put the same amount of coal on the stub. Each day he will send in this coupon. At the end of the month he will send in his book to see that the stub and coupon correspond. With reference to the saving of fuel, it seems to me we have to take into consideration many things. We have a circular letter to the men which covers a good many points. You know when you talk to a man about saving fuel he says: "Well, my engine is not in any shape;" "My conductor is not quite so spry as John Brown's conductor," and so on. We have arranged to overcome this in this way: For instance, we will take two passenger trains with a given number of cars, between Chicago and the Mississippi River (Clinton, Iowa), and having the same class of engine, and going over the same topography of road. They have the same condition of elements to contend with, and if the engines are in alike condition they ought to have about the same record, and if John Brown shows that it costs $6 per 100 miles of his run and John Smith with the same engine and same class of train shows a cost of $9, we will arrange to call John Smith in and ask him if he thinks the company can afford to spend $3 more per hundred miles on him than on John Brown. We simply say to him that this will amount to $1,440 a year and we cannot stand it, and will not stand it, and if he says the difference is in the conductor and so forth, I simply propose to put him on the other man's engine for thirty days and give him every chance to show whether the trouble is in the machinery or the train he is pulling.

We have a clause in our E. & F. schedule which says that "ability shall be paramount to age or rank in service." I do not know of any better way to get at a man's ability than by his fruits. The good book says, "By their fruits shall ye know them."

PRESIDENT GIBBS: I notice in Mr. Forsyth's paper one very important point, viz.: that the pounds of coal per car mile have been gradually increased during the last ten years from 5½ to 6½ pounds, or 18 per cent. I would like to ask some one from the C. B. & Q. road how they account for this increase.

MR. RHODES (C. B. & Q.): If you will look at our diagram on page 168 [December proceedings] you will get at some interesting things. You will find that in 1886 the pounds of coal per loaded freight car mile is down quite low, compared to what it was before. We were about that time giving our men a premium for economy in fuel on one of the divisions, and were watching it very closely on other divisions. In 1888 our strike came and all such records were abandoned. You gentlemen who have been through the late July strike know that when you have new men on the engines, or when you are on the engines yourselves, you are only too glad to have steam; you do not figure how you get it. This was the case in 1888 on our line and the table shows the results. It is a fact that you could hear engines blowing off constantly all over our lines wherever you rode over the divisions. The men were not familiar with the engines fuel or grades, and the diagram shows the results. Along in 1889, or toward the end of 1888, we organized a department for keeping down our fuel expense and one man was employed to do nothing else but give his attention to our fuel accounts, and instruct and educate the men. Among other things that he did was to bring into prominent attention before our men what blowing off of the pop valve meant and accurate figures showed that for each second that an engine popped off it was equal to wasting a lump of coal the size of your fist.

In Mr. Bush's paper, he says that this fuel economy devolves largely upon the mechanical department. There is just where I think the mistake is made, viz.: in having it depend upon the mechanical department. If I had my way on a railroad I would have the general manager hold the general superintendent responsible, and the general superintendent hold the division superintendent responsible, and I would have all explanation for the waste of coal and too much consumption of coal go from the division superintendent's office. I would have the master mechanic co-operate with the division superintendents and the superintendents of motive power co-operate with the division superintendents and master mechanics in endeavoring to get better results. There are several reasons why that would be a wise move to make. In the first place, on very few roads has the superintendent of motive power or the master mechanic anything to do with the placing of coal orders. On the contrary, on many roads the superintendents have the placing of the coal orders. If the division superintendent has nothing to do with it the general superintendent or general manager has. The superintendents get out the time cards, regulate the speed of the trains, conduct investigations, and administer discipline when trains have not been expeditiously handled, and by long odds are more capable of handling and influencing the consumption of fuel than any other department official.

MR. HERR (C. & N. W.): It seems to me that we should not altogether despair of making some improvement in the matter of coal consumption because of the fact that it may be difficult or perhaps impracticable to get at the exact weight of the coal consumed. We can at least make a fair comparison between the engineers using the coal, even if we take the weights from the mines, as has been done on different railroads. We get a figure that is certainly as fair for one man as for another.

In Mr Forsyth's paper where increase in consumption of coal is shown on the C. B. & Q. road, it seems to me that special stress should have been laid upon the large increase in the capacity of the cars. A couple of years ago I investigated the matter and found on certain divisions that as many as 80 per cent. of the cars hauled in a train were over 40,000 lbs. capacity. Certainly ten years ago there were almost none of that capacity in trains. This has a very great influence on the performance of engines, when rated on car per mile or train per mile basis.

MR. DAVID L. BARNES: I have a diagram here, giving the results of some experiments. [Mr. Barnes showed some of the results of French experiments with which our readers are familiar.] When the compound locomotive tests were made on the St. Paul, you will remember that Mr. Gibbs had a diagram like this and that it gave about the same indication. I have compared several tests made in England, and they show about the same thing, viz.: that as you force an engine you will get less efficiency. Now, Mr. Forsyth has shown one way in which there may be bad engine performance—that is form poor, cheap coal. There is another way, and that is shown by the diagram; it is from heavy trains. Heavy trains are economical from an operating standpoint, but make the locomotive less economical as a steam engine.

A. W. GIBBS (Pennsylvania R. R.): Although Mr. Forsyth in his paper on "Locomotive Fuel" deals with the heat value of Western coals, his reasoning is equally applicable to other coals.

While the practical application of this paper is the determination of the relative money values of the different coals, it has also a bearing upon the "Standard Form of Locomotive Fuel," as recommended to the Master Mechanics' Association, and it is because some of the methods recommended in each of these papers give misleading results, I venture this criticism. The methods referred to are the chemical and the calorimetric.

The writer has had occasion to tabulate the results of a number of coal tests made with the same locomotives under similar conditions in which tests, in addition to the data usually taken, a chemical analysis and a calorimeter test were made of the coal used each day. It soon became evident that the results of the latter tests were often in conflict with the actual results, so much so in fact as to make it a question whether much reliance is to be placed upon laboratory tests of this kind. The chief criticism of the chemical test is that it is not sufficiently thorough, the composition of the volatile matter not being fixed. These constituents may be already partially oxydized, in which case the available heat value is reduced. The calorimeter as a means for determining the heat value is, I think, little more than a scientific toy, very interesting but very misleading, because the condi-

tions governing the combustion in the calorimeter differ so widely from those of actual service. I think that the most that can be said for this test is that it gives an idea of the relative possible heat values.

I think that the only way of determining the commercial value of the coals is by testing them under conditions similar to those of the proposed service.

For railway purposes a test similar to that at Purdue University would settle this question, giving results which can be obtained in no other way. The results, not being complicated by the unavoidable variation of service, would be quickly and cheaply obtained.

MR. H. E. SMITH (C. M. & St. P.): I think that the intrinsic value of coal does depend exactly on its chemical position; and the fact that in service we do not get that intrinsic value is not the fault of the analysis. We have to consider also the conditions of combustion. The intrinsic value of the coal does furnish a limit toward which to work in this direction. As far as analysis is concerned perhaps the fact that it is not very thoroughly appreciated by the engineers may be in part the fault of the chemist. Our ordinary coal analyses are not sufficiently complete to tell all that we should know. If each shipment is to be inspected the approximate analysis as given by Mr. Forsyth is probably all that could be attempted; but a number of other things will add a great deal to the information which that gives. For example some time ago we analyzed a couple of coals from the West. The fixed carbon in some was within 1 per cent. of some of the medium grades of Pennsylvania coal, yet it would be folly to say that these coals were equal to Pennsylvania coal. If we had extended our investigation and made an ultimate analysis we would probably have found that the oxygen in the light coal, which was a sort of semi-lignite, was considerably greater than in the ordinary bituminous coal. The specific gravity is always an important test to make. The gravity of the powdered sample indicates the nature and also the substance of the coal, while if you take the gravity in large lumps the difference between these two gravities tends to show the porosity of the coal. We have on our line some coals difficult to use on this account. They analyze very well, but they fly to pieces so readily they do not give good service results. With reference to Mr. Forsyth's remark on the simplicity of the analysis and the employment of a boy to make it on the ground of cheapness I do not think any master mechanic would adopt that principle in running a locomotive. A boy could learn the levers and valves of an engine in a very few days in the same way that he learns the manipulation of the coal analysis but the master mechanic would certainly not set him to running an engine.

Mr. Forsyth submitted to the Secretary the following written discussion based upon what had been said at this meeting.

MR. WM. FORSYTH (C. B. & Q.): The discussion of my paper has brought up a number of facts relating to coal burning on locomotives which must be some help toward the solution of the fuel problem on railroads.

The first part of the discussion seems to center in the controversy over wide and narrow fire boxes. I think it can be taken as a general statement which is very near the truth that the poorer the fuel the larger should be the grate. With the poor fuel used in the West I do not believe that we have with the ordinary boiler construction reached a size of grate which is too large. . . . I believe there has been a greater gain in the direction of economical coal burning by the introduction of fire-boxes 42 inches wide and 8 to 10 feet long than in any other one item in the mechanical construction of a locomotive. In regard to the relative value of tube heating surface and fire-box heating surface, the experiment on our road referred to by Mr. Higginson seems to indicate that the fire-box surface is so much more efficient that the tubes may be shortened and the fire-box lengthened with economical results. While this might not be true for a perfectly clean boiler, it doubtless is the case with boilers as ordinarily found coated with scale and mud. The tubes get a very much thicker coating of scale and mud than the sheets of the fire-box. I do not think that the relative value of tube-heating surface and fire-box heating surface can be definitely stated except as applied to clean boilers.

In regard to the best method of finding the relative value of coals I agree with Prof. Goss and Mr. A. W Gibbs, in recommending a small test boiler as preferable to the calorimeter, and the principal reason is that it deals with a much larger quantity of coal, and burns it under conditions more like those in which coal is generally used. The Pennsylvania railway has been conducting coal tests in this way with a boiler in Philadelphia for several months past. . . .

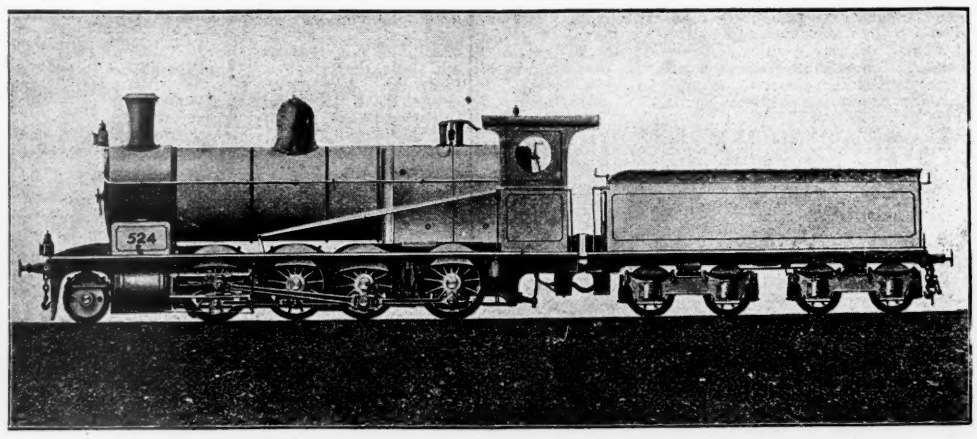
In regard to fuel accounts, it seems strange that the effect at reduced expenses has reached the largest item of expenses last. But there seems now to be a general awakening to the fact that it will pay to keep the fuel account of locomotives in such detail as will enable us to know how much saving we are making, and to handle the coal with definite measurements, so as to deal fairly with the enginemen, and then require of them, in return, a better service.

The coal premium system described in Mr. Bush's paper is doubtless the best way of handling the subject, and I expect to see it go into more general use on railroads, the same as piecework is getting into general use in the shops. The principle in both cases is to pay the men in proportion to the amount of work done, and to the care and interest which they take in their work.

A New Standard Locomotive for New South Wales

The reader who is interested in such matters is probably tolerably familiar with the effort of the Railway Commissioners of New South Wales to introduce heavy modern freight locomotives in that country. In 1891 the Baldwin Locomotive Works shipped to that colony 12 passenger engines, and 20 consolidation freight engines, of which latter two were compounds. These were illustrated in the *Railroad Gazette* of Aug. 7, 1891, and received a good deal of attention, owing to various circumstances. It is enough to say that they have done their work well, but that they have not had altogether smooth sailing in the colony, partly because of concerted and persistent efforts to discredit them on the part of politicians and of people acting for business reasons.

The upshot of the whole affair is that the Commissioners have caused to be designed a new type, known as the "Australian consolidation engine, designed in 1894." This, the Commissioners believe, "will be one of the most satisfactory engines for goods train working on lines of heavy grades yet constructed, as it embodies the careful combination of all the best qualities of the American and English locomotives. We have been able to effect this result, as a large number of engines of both classes have been in use on these lines for many years, and our locomotive officers have consequently been able to study and appreciate the relative qualities of both types, under all conditions." The engraving we reproduce from a very



Australian Consolidation Engine of 1894.

recent supplementary report of the Commissioners. The principal dimensions are as below:

Type	Consolidation.
Name of operating road	New South Wales Government Rys.
Gage	4 ft. 8½ in.
Simple or compound	Simple.
Weight on drivers	149,120 lbs.
Weight on truck wheels	13,440 lbs.
Weight, total	162,560 lbs.
Heating surface, firebox	166 sq. ft.
Heating surface tubes	2,045 sq. ft.
Heating surface, total	2,211 sq. ft.
Grate area	29¾ sq. ft.
Drivers, number	Eight.
Drivers, diameter	51 in.
Truck wheels, diameter	33½ in.
Cylinders, diameter	21 in.
Piston, stroke	26 in.
Boiler, working steam pressure	160 lbs.

The Expert Board on Rapid Transit.

The report of the Board of Experts appointed to examine the report submitted by the Chief Engineer and approved by Messrs. Cooper and Fteley, presented its report to the New York Rapid Transit Commissioners last Tuesday, and we regard it as an admirable study of the situation and very practical and judicious in its recommendations.

Considering the difficulties and uncertainties of underground construction, especially under lower Broadway, the Board after independent examination of the estimates of the Chief Engineer by each of the members, concludes that these estimates are reliable, in some respects liberal, but not too much so in view of the contingencies.

It concludes that the plan of construction proposed by the former Commission is unsatisfactory for the reasons suggested by the Chief Engineer, and that his suggestion is a great improvement upon the previous plan and can be executed at much less cost. The Board agrees with him that 44 ft. is too little for four tracks on a level in an underground road and that the safety of the traffic should not be endangered by adopting less than 50 feet in width and 13 feet in height.

The proposal to treat local and express tracks as two separate roads is also approved. It will greatly diminish the expense, simplify construction, permit better gradients and admits of the construction of two of the tracks without building the other two until necessary. The suggestion is therefore a valuable one. The Board recommends, however, that the tunnel walls and arch roof as proposed by Mr. Parsons be modified so as to give greater strength, at probably a less cost, by adopting concrete masonry lined with brick and re-enforcing with steel beams. It is also suggested that the sewers should not form an integral part of the subway structure.

Finally the Board was requested to suggest any better solution of the problem before the Commission either as to route or construction than has already been brought forward. The Board concludes than it will be necessary to modify the plans that have already been provisionally approved by the Commission which contemplate a three track line on one level from South Ferry to Vesey street, a two track loop at City Hall, a four track line from City Hall to Fourteenth street, through Broadway and the Boulevard and Eleventh avenue to One Hundred and Eighty-fifth street, a two track line from Kingsbridge northward. If this route is adhered to, the Board believes it should be modified by constructing two tracks in tunnel from South Ferry to City Hall, including the loop, four tracks along Broadway in tunnel to Ninety-second street, the express and local tracks being on different levels from Ninety-second street, the tracks to emerge and be continued on an elevated structure to the Morningside Plateau and thence to continue partly by a depressed road, partly by tunnel and partly by viaduct to One Hundred and Eighty-fifth street.

The Board is convinced that by the use of electric motors an average speed of 25 miles an hour, including stops, can be had, with half mile stations, which would, in a great measure, do away with the objection of deferring the construction of two of the four tracks. As confirming this view it is stated that the stations at 125th, 135th, 145th and 155th streets, on the Manhattan line, west, are half a mile apart, with a descending grade of 10 to 12 feet per mile toward the north. Five-car trains, weighing 115 tons loaded, make 30 miles an hour northward, including stops, and 20 miles southward.

It would be desirable, but not indispensable, to arrange with the Metropolitan Traction Company for transfer tickets.

The suggestion of four tracks, mostly elevated, between 92d street and 185th street, is for the reasons that an elevated road should always be preferred to an underground road, not merely because of its economy of construction, but because of the difficulties of adequate light and ventilation; and that four tracks between 92d street and 185th street are required for the local distribution which will need more frequent stations to accommodate the traffic to be created by the construction of the system through such an attractive region. This west side plan as described will cost $29,500,000.

For the east side the Chief Engineer suggests an underground line from Union Square, with four tracks through Fourth avenue under the Grand Central to 44th street; thence two double track tunnels to 97th street; thence a four-track viaduct to Mott Haven; thence a two-track viaduct to Williamsbridge, costing in all $22,200,000. But the aggregate cost of the two lines, east and west, thus proposed, will be $51,700,000, and adding 10 per cent. for terminals and side tracks will be $56,870,000, showing the necessity for a still further reduction.

In lieu of the Broadway route from 14th street to City Hall, the Chief Engineer has suggested a route by Fourth avenue, Lafayette Place and Elm street. The Board concludes to recommend this substitution as far as City Hall Park, because the cost will be reduced by the sum of $3,700,000, and the congestion of Broadway will be avoided and the serious interruption to Broadway business during construction will also be avoided. Such interference with traffic on Broadway could only be permitted if no other suitable route can be found. The proposed route is no longer, is less expensive, and is but 450 feet distant from Broadway.

It may be desirable to avoid the sewers at Canal street by emerging for a short distance and then going again underground.

The Board recommends that above 14th street the express tracks be carried along Broadway in a rock tunnel to avoid disturbance of the surface between 16th and 23th streets; that four tracks be constructed along 42d to 23d street; thence two local tracks through 23d, under Madison Square to 25th, and then the regular four-track system be resumed on Broadway.

On the east side line construction is recommended of four tracks under Fourth avenue, from 23d to 42d street; thence two tracks under the Grand Central to 97th; thence a two-track elevated structure to Mott Haven. The Board also recommends an east and west two-track road under 42d street, to connect with the west side route, which may ultimately be extended to connect with the tracks of the New York Central at the river front.

The cost of the recommended line on the east side above 23d street, including the cross-town 42d street line, will be $12,025,000. The total cost of the lines so recommended, including 10 per cent. allowance, will be $42,064,000.

The Committee further suggests a two-track elevated extension from the 4th avenue line westward, on some street just north of Central Park to near Sixth avenue; thence northward through the blocks to the Harlem. Such a line, two miles long, would cost about $2,500,000, and would serve a district capable of dense population. The Board calls attention to the fact that it will ultimately be desirable to extend the west side line from 185th street by a two-track elevated structure to Kingsbridge, to connect with the New York Central, at a cost of $1,500,000.

It would be desirable to secure extension of the New York Central along the North River below Fifty-ninth street by an elevated structure, to serve the water front.

IMPROVEMENTS OF THE MANHATTAN SYSTEM.

After an exhaustive examination of the plans the Board has recommended a rapid transit system, independent of all existing routes, which can be executed within the limits of cost prescribed. But this will not give immediate relief, for the process of construction will be slow, unforeseen impediments will arise, and we must not expect early completion of the undertaking. Unless a responsible bidder shall be found, the undertaking must be abandonod. Hence, the Board has carefully considered the relation of the existing Manhattan system to the problem.

This system occupies four of the best avenues of the city and controls lines which extend the length of the island and into the annexed district, and is capable of a much greater development. The company is bound by its charter to furnish rapid transit. This it does not now do. Rapid transit implies a speed of at least 25 miles an hour, including stops. The present express service on the Ninth avenue line is inadequate and unsatisfactory in consequence of interference with local trains; but it shows how rapid transit can be secured at an early day on all of the lines of the Manhattan Company.

If each of the present lines were provided with four tracks, two of them could be devoted to rapid transit without interfering with local trains, and the effective capacity of the lines doubled, giving genuine rapid transit for long distances. But at the outset rapid transit can be secured at once by the addition of a third track upon each of these lines. The Board suggests the provision of such third tracks. In the morning express trains would be run down on the Sixth avenue and Third avenue lines, returning on the Ninth and Second avenue lines; in the evening express trains would run northward on the Sixth and Third avenue lines and return on Ninth and Second avenues. This would relieve much of the existing difficulty, and enable the Manhattan Company to fulfill, for the present, the requirements of its charter and grants, which are not now performed by the kind of transit it furnishes.

The Board is of the opinion that the Manhattan Company should be required to lay down these additional tracks and make the necessary changes in order to establish an immediate rapid transit service without delay. The Commission has power to grant the necessary authority with proper conditions as to motive power, speed and service. The company may plead that the present service is up to the full capacity of the lines, which is true; but such a plea will not be accepted by the public or by the courts when the requisite authority is granted for the proposed extension of tracks. If these improvements are made, electric power should be substituted for steam as soon as practicable; then the speed of the local trains could be increased to 17 miles an hour.

It may be objected that this arrangement would deter bidders for the new system. The Board believes that before the new system can be put in operation the increase in traffic will be fully equal to the ultimate capacity of the Manhattan system and of the new lines combined.

To sum up, the provisional lines adopted by the Commission are impracticable, for their cost will exceed the limit of $50,000,000 imposed by the act.

The route and plan may be employed to bring the cost within the limits of the act and still provide for rapid transit independent of any existing system both on the west and on the east sides.

The cost of construction can be largely reduced by an arrangement with the New York Central for the construction of the east side line above Fourteenth street; but if no such arrangement can be made it will be perfectly practicable to construct an independent line without interfering with that company.

All possible routes should be utilized and the Manhattan system, the New York Central and the New York & New Haven should all be required to enlarge the means of transportation for passengers and freight.

Wherever practicable the use of viaducts instead of subways is recommended.

A form of construction for subways and viaducts should be adopted that will allow the building of only two tracks where desirable, for trains of cars with electric motors can be run at 17 miles an hour, with stations 1500 feet apart, or at 25 miles an hour with stations half a mile apart; and trains of more than five cars can be run at maximum speed, making the train capacity of two tracks with electric traction much greater than that of the present elevated roads with steam power.

The following route and number of tracks for present construction are recommended:

Two-track subway from South Ferry to City Hall Park, under Broadway, with loops at Battery and City Hall Parks.
Four-track subway from City Hall Park, under Elm St., and Lafayette Place to 14th St.
Two-track subway in rock tunnel under Broadway from 14th St. to 25th St., for express trains, to be built without breaking surface of Broadway.
Four-track subway under Fourth Ave., from 14th St. to 23rd St., and two-track subway under 23rd St. to Broadway for the local trains, joining the express subway at 25th St.
Four-track subway under Broadway from 25th St. to 92d St., to be constructed on different levels at least as far as 34th St.
Four-track structure, mainly viaduct (with subway under Morningside Plateau), along the Boulevard and 11th Ave. from 92d St. to 185th St.
Four-track subway under Fourth Ave. from 23d St. to the Grand Central Station.
Two-track subway under Fourth Ave. from the Grand Central Station to 97th St.
Two-track viaduct along Fourth Ave. from 97th St., thence crossing the Harlem River to Mott Haven.

The length and cost of viaduct and subways is as follows:

Length of subways	13.91 miles.
" " viaducts	4.97 "
Total length	18.88 miles.
Cost	$42,033,721

These figures are based upon the estimates of the Chief Engineer heretofore approved, and include the construction of the railroad and station, reconstruction of sewers, restoration of street surface, interest during construction, allowance for contingencies, and 10 per cent. for shops, storage tracks, terminal yards, etc. They include no allowance for administration and engineering, which by the act are not a charge upon the fund. No account has been taken of the cost of the property, property rights or abutting damages, but the difference between the estimates of the cost of the modified lines and the fund contemplated by the act ought to be sufficient to cover such expenditures. The report is signed by Messrs. Abram S. Hewitt, O. Chanute, Thomas C. Clarke, William H. Burr and Charles Sooysmith.

The Manufacturers' Convention.

The National Convention of Manufacturers, which we announced three weeks ago, assembled in Cincinnati on Tuesday of last week, Mr. Thomas P. Egan, of the J. A. Fay & Egan Company, being temporary chairman, and also permanent chairman of the convention when organized. The gathering of manufacturers from all over the United States was large and representative, and the affair seems to have gone off with a great deal of enthusiasm.

A National Association was formed, with the following officers: President, Thomas Dolan, of Philadelphia; Treasurer, Robert Laidlaw, of Cincinnati; Secretary, E. P. Wilson, of Cincinnati. Vice-presidents were elected one from each State and Territory, which list, being very long, we shall not print. It includes, however, Mr. Egan, of Ohio; Mr. P. E. Studebaker, of Indiana, and Mr. George Sellers, of Delaware. Mr. Laidlaw, the Treasurer, is President of Laidlaw-Dunn-Gordon Company, of Cincinnati, and Mr. Wilson is Commissioner of the Cincinnati Freight Bureau. Mr. Dolan, the President, is a woolen manufacturer, of Philadelphia.

Mr. Egan, as chairman of the temporary organization, began the proceedings with a short speech, setting forth the objects of the convention. These were summarized in our issue of January 11, page 26. Briefly, we may say that the announced purpose of the convention was to get an organization that could act in concert to advocate beneficial legislation; to improve trade relations with foreign countries; to establish expositions abroad; to extend the commercial marine, and to promote the Nicaragua Canal.

Governor McKinley welcomed the delegates in behalf of the State of Ohio, his address being the development of ideas with which the country has become thoroughly familiar. He was followed by the Mayor of Cincinnati in a very short address. It was expected that Mr. Warner Miller would address the convention at its first session, but as he was absent, Mr. Heber Clark, of Philadelphia, made a speech, sound from the standpoint of the protectionist and the believer in a double standard of values.

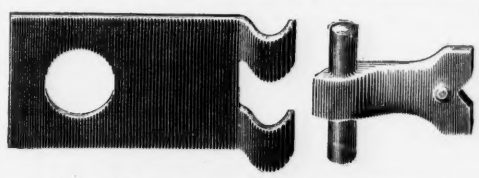
At the second day's session the Committee on Resolutions submitted the following, which were adopted: That to the largest possible extent our home market should be retained and supplied by our own producers, and our foreign trade relations be extended in every direction not inconsistent therewith; the principle of reciprocity should be embodied in national legislation; a judicious system of subsidies to American vessels should be adopted; the Nicaragua Canal should be constructed and operated under the control of the Federal Government; natural and artificial internal waterways should be improved, and extended by the Federal Government.

In this session Mr. Egan introduced Mr. Ingalls, President of the Cleveland, Cincinnati, Chicago & St. Louis, who made an admirable address, expressing a good deal of sound doctrine. With regard to tariff legislation he regarded the McKinley plan and the Wilson plan as extreme, and both bad, and advocated such a tariff as would give the Government sufficient revenue, which tariff would give incidental protection, and all the protection needed. He advocated strongly the construction of the Nicaragua Canal, although he does not appear to have expressed himself on the matter of Government assistance in, or responsibility for, the enterprise. He spoke very decidedly in favor of the gold standard of values, also in favor of the registry under the American flag of foreign-built vessels. These, he said, might be protected as other importations are, "but to absolutely prohibit their purchase is to defeat our hope of getting a marine service. If the world were open to us to buy vessels, very soon we would get back our own carrying trade, and a portion of that of other nations." He advocated Government subsidies to vessels sailing to South American ports, and the establishment of South American agencies by American manufacturers. Finally, he suggested the following platform for the convention: "First, a commission of business men to readjust the tariff; second, the enactment of such laws as will give us a dollar current in any of the commercial markets of the world; third, mail routes established by the Government that will give us a mail to and from all the capitals of South America at least twice a month."

Mr. Warner Miller spoke at much length in favor of the Nicaragua Canal, and of Government aid to the enterprise.

The McDonald Nut-Lock.

We give herewith an illustration of the McDonald nut lock, in which the principle of the jack-knife spring has been utilized to hold the lock against the nut. A hinge-plate of spring steel, about $\frac{3}{32}$ in. thick, is punched at one end for the bolt. At the other end it is cut and formed



much like a hinge. A dog fits in the hinge end, and when the nut forces the hinge-plate against the angle plate the dog is secured in place like a half-way opened knife blade, as shown in the cut. The nut is then screwed down as tightly as desired, the hinge-plate forming for it a thin washer with a full bearing-surface capable of standing all the strain which the bolt can apply, and pressing equally on all edges of the nut. The dog is then snapped against the nut, where it is tightly held by a ridge on its pivoted end, which acts like the corner of a knife blade on the spring, but with much greater force. The dog will, as illustrated, hold the ordinary square or hexagon nuts by the flat side or the corner, allowing, respectively, one-eighth and one-twelfth turns. The lower edge of the angle plate prevents revolution of the nut lock; and the dog is not damaged while the nut is being screwed to its seat, and it can be opened, removed and re-used frequently without damage.

The McDonald Nut-Lock

THE SCRAP HEAP.

Railroad Logging in the Northwest.

The Brainerd & Northern Minnesota Railroad, recently referred to in these columns as the most important logging railroad operated, has completed a landing at Brainerd, Minn., that is remarkable in many ways. At this point the logs brought down from the choppings on the trains are rolled into the river or on the ice to await the coming of the spring freshets and the thawing of the stream to float them to the mills. Brainerd is the northern limit of the Mississippi & Rum River Boom Co., which handles the logs free to Minneapolis. The road hauls them 50 miles to dump in at this point and avoid all expense of driving. At this new landing the company has just put in an electric lighting plant, so that the handling of loads can be carried on day and night. Twenty 2,000-candle power lamps are suspended along a distance of 3,000 ft. The landing, which is 300 ft. long, is cut out of the bluffs that line the west side of the Mississippi at this point, and is nearly 40 ft. above the level of the stream. The logs are rolled from the cars and into the river, where they form a dam nearly the entire width of the stream, leaving only a narrow space along one side for the water to run, and for the logs to start. It is expected that there will be nearly, or possibly more than, 100,000,000 ft. of logs at this rollway when the spring drives begin. At the present time seven trains of 40 cars each are unloaded there daily, making about 1,000,000 ft. of logs.

More than half as many logs are being put in daily at the other large landing on this same stream, that of the Duluth, Mississippi River & Northern at the mouth of the Swan River.

In the Duluth lumber district the logging road of Mitchell & McClure is handling about 200,000 ft. a day, the road of the Cranberry Lumber Co. about the same, as is that of the Lake Superior Lumbering Co. The Duluth, Missabe & Northern road will haul down to Duluth nearly 40,000,000 ft. in the winter, and the Duluth & Iron Range about 20,000,000 ft.

South of these choppings, on the line of the Eastern Railway of Minnesota, on the northern branch of the St. Croix, about 9,000 men are at work, some chopping for logs to be hauled by rail, but most for the waters of the St. Croix River. They will cut during the winter about 850,000,000 ft. All this timber is what was burned by the forest fires of last season, and must be cut this season to preserve it. Nearly all these logs will be sawn at points on the Missssippi River below the city of Minneapolis, some of them as far south as Dubuque.

The Ashland district, east of the head of Lake Superior, is cutting about 250,000,000 ft., and the Ontonagon district, still further east of Lake Superior, about 185,000,000 ft. South of these points, on the St. Croix and Wisconsin rivers, about 600,000,000 ft. are being cut, but most of this timber, as well as that of the Ashland and Ontonagon districts, goes out by water.

Another Decision on the New York Pass Law.

The Supreme Court has decided that, according to the new Constitution, notaries public cannot ride on a railroad pass. The case was brought by the Attorney-General against William F. Rathbone, one of the counsel of the Delaware & Hudson, at his request. He had used a pass on the Delaware & Hudson, between Albany and Cohoes, since January 1. In his opinion, Justice Herrick says:

"It seems to me that a notary public comes within the definition of what constitutes a public officer. When we are asked to look beyond or behind the language used for the purpose of ascertaining the mischief against which the prohibition was directed, and thus restrict its operation, we are asked to go into an exceedingly dangerous field of inquiry. Each class or kind of public officers in the State could be taken in turn, and as to each it might be held that it did not refer to them, because the mischief intended to be prevented could not be worked by them in their particular official positions; and, as to others, the court might well say that it would not presume that such officials could be guilty of the mischief aimed to be prevented, and, therefore, that such officials did not come within the meaning of the Constitution. One class after another might be thus eliminated, until the clause in question would be a dead letter. Courts will not seek to elude or evade the Constitution, but rather to enforce and uphold its true intent and meaning, and where the language is clear and unambiguous, that intent and meaning is to be gathered from the language used; and where plain ordinary words are used, they will give them the meaning that is ordinarily attached to them at the time they were used, and not attempt to inject into them a new force and meaning, or by judicial construction deprive them of their full power and significance. In this case, plain, ordinary, comprehensive words have been used, words with a well-understood meaning, and the only function for the Court, therefore, is to declare the law as it is written; as the Constitution has recognized no difference between public officers, the Court can recognize none. For these reasons the demurrer must be overruled, with costs."

The Toronto Water Works Tunnel.

Engineer Keating is preparing plans and specifications for the purpose of calling for tenders for the boring and survey necessary for the tunnel under Toronto Bay to provide a water supply for that city.

RAILROAD GAZETTE

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EDITORIAL ANNOUNCEMENTS.

Contributions.—*Subscribers and others will materially assist us in making our news accurate and complete if they will send us early information of events which take place under their observation, such as changes in railroad officers, organizations and changes of companies in their management, particulars as to the business of the letting, progress and completion of contracts for new works or important improvements of old ones, experiments in the construction of roads and machinery and railroads, and suggestions as to its improvement. Discussions of subjects pertaining to* ALL DEPARTMENTS *of railroad business by men practically acquainted with them are especially desired. Officers will oblige us by forwarding early copies of notices of meetings, elections, appointments, and especially annual reports, some notice of all of which will be published.*

Advertisements.—*We wish it distinctly understood that we will entertain no proposition to publish anything in this journal for pay,* EXCEPT IN THE ADVERTISING COLUMNS. *We give in our editorial columns* OUR OWN *opinions, and those only, and in our news columns present only such matter as we consider interesting, and important to our readers. Those who wish to recommend their inventions, machinery, supplies, financial schemes, etc., to our readers, can do so fully in our advertising columns, but it is useless to ask us to recommend them editorially, either for money or in consideration of advertising patronage.*

The essentials of the report of the Board of Experts on New York Rapid Transit are published on another page. We cannot speak too highly of the practical sagacity of this report. The Board has looked at facts as they are, and not as somebody wishes they might be, and the report has the value which always attaches to a candid and judicious study of facts. It has the immense merit of suggesting something practicable—that is, practicable *if* there is any power, of law or of self-interest, which can bring about a working agreement with the Manhattan Company. This seems to be a big if.

Governor Greenhalge, of Massachusetts, has refused to pardon the Old Colony Railroad officers who have been imprisoned for four months for inciting men to riot at a crossing dispute in August, 1893. He presented to the Council a long statement of reasons for disregarding the advice of a majority of that body. He expresses personal sympathy with the prisoners and wishes he could have found good ground for signing a pardon, and he admits that in a moral sense the offence of the men is chargeable to others, meaning the higher officers of the road; but the arguments in favor of a pardon he holds to be unsound. It is claimed that the prisoners were deprived of a trial by jury through misunderstanding of counsel, but the Governor calls attention to the fact that the men had had frequent opportunity for a trial. In other words, the case had been several times staved off by the strenuous efforts of the road. If prisoners are to be let off because they have been unwisely advised by their counsel a general jail delivery might result. There was no miscarriage or failure of justice. The railroad officers claim that the intention was to use force merely in a formal way in order to make a case for the courts, but the Governor answers this by saying that a small party of men would have been sufficient for that. In point of fact, the company brought a large body of laborers from another town, and such a display of force is a menace to the peace of the State, tending to bring about a collision such as actually happened. It was alleged before the Governor that Mr. Sanborn had been treated harshly in prison, but he reminds the lawyers that Mr. Sanborn made no complaint on this ground himself.

Can fuel clerks and traveling firemen earn their wages and enough more to offset the cost of the time and trouble of the general manager in looking after them? This is the question which the Western Railway Club has stirred up and which brought out enough evidence from the mechanical departments during the discussion (see other columns of this issue) to cause the question to be opened again on some roads where it had been decided to abandon all but the train-mile basis and the bulk measurement at the coaling chutes. If one can take the talk of the mechanical departments as representing the facts, it is hard to avoid the conclusion that there has been too much microscopical search into the losses of small supplies, and some desire to avoid the harassing work of stopping the great losses of fuel that appear to be taking place on lines that have earned a wide reputation for close economy. If from 15 to 40 per cent. of the fuel bills can be saved, as is claimed by those who ought to know, there will be no better time to commence such a saving than right now when dividends are hard to produce and when the savings help wonderfully to show a balance on the right side of the ledger. The principal points of the discussion are given in this issue of the *Railroad Gazette*, and they are worth reading, even if one has made up his mind that traveling firemen and fuel clerks are luxuries to be enjoyed only by roads that can afford statistics.

Our friend, Mr. "Luke Forward," writes on another page concerning the much debated question of what shall be used for fixed signals at night, and, speaking from the standpoint of the idealist, we quite agree with him, that the form and position signal is the logical one. Under ideal conditions in the ideal world, this will, we doubt not, be the solution of the signal question; but we are not at all confident that the ideal conditions will be realized very soon. A few years ago one of the great railroads announced the abandonment of color for night and day, and painted its semaphores yellow in order that their significance should depend entirely upon form and position, and undertook to introduce an iluminated semaphore for night use. We do not learn, however, that the illuminated semaphore has yet replaced the green and red lamps on that system. While we would not say a word to discourage the inventor; while, on the contrary, we trust that he will continue to invent and advertise, and while we believe that he will ultimately "get there," still we fear that for a considerable period yet the night signal will have to be color. No illuminated semaphore has yet appeared above the horizon which, by its combination of cheapness, brilliancy and durability promises to replace the colored lenses. Meantime, we shall continue to urge the green light for safety, and to wish the illuminated semaphore men "speedy and great success."

The Proposal to Abolish Grade Crossings in New York.

The bill to promote the abolition of grade crossings, which the New York State Railroad Commissioners have prepared, was introduced in both houses of the Legislature last week. It is in the main the same proposition that the Commissioners have recommended in previous years. The Commissioners have urged action in this direction for many years, but the Legislature has done nothing. Now there has been a change of political control, and it remains to be seen whether this project will fare any better than in former years.

This bill is of interest as embodying results of recent investigation of the subject, without regard to its prospect of passage. It provides that all new railroads must go above or below existing highways, except by leave of the Railroad Commissioners. This permission should be granted only in rare cases. New streets are made subject to the same rule as regards existing railroads. To abolish existing grade crossings application may be made to the Railroad Commissioners, or that body may act of its own motion. There is no provision for a special commission, as in Massachusetts, but the bill provides for appeals to the courts. A new railroad must avoid the street level at its own expense; where a new highway crosses a railroad, the railroad must pay half the expense of the necessary bridge and approaches, and where an existing grade crossing is changed the railroad must pay 62½ per cent., the town or city 25 per cent., and the State 12½ per cent. The amount to be paid by the State in any one year is limited to $100,000, which practically limits the total expenditure for changing existing crossings to $800,000 a year. There is also a clause requiring new electric railroads to go above or below steam railroads where they cross at the expense of the construction company.

This New York bill is like the Massachusetts law only in outline. In the latter State a special commission of three experts must be appointed for each crossing and the action of this commission is reviewed by, and must receive the approval of, the Superior Court. The amount paid by the town or city is never more than 10 per cent., and the State pays 25 per cent., so that the railroads have to bear 65 per cent. of the total cost, which includes the approaches and all expenses, including those of the special commission. The State has pledged itself to pay a maximum of $500,000 a year for ten years. Assuming that the State pays one-fourth of the cost at each crossing, which has been the percentage decided upon in nearly every case (except in large undertakings like that at Roxbury, for which a special law was passed) the possible maximum expenditure per year may be $2,000,000. This sum has never yet been reached, although the law has been in effect four years.

The Massachusetts law has been the means of abolishing a large number of crossings already, although but a small percentage of the total number in the State. Its success thus far has been due to the large appropriation by the State, added to which is the fact that the Boston & Albany, the richest road in the State, desired legislative permission to increase its capital stock at about the time when the law was under discussion and, in order to secure this permission, accepted the condition that $1,000,000 of the new stock should be used in eliminating highway grade crossings. The liberal appropriation by the State inured to the benefit of the towns, and the smallness of the percentage which the towns have to pay has proved the immediate incentive for many of the improvements undertaken. Railroad companies have a strong predilection for expending their money on their own premises, and those roads which desired to spend any money in this way applied very soon after the passage of the law for leave to change a good many crossings where the land damages outside the railroad right of way would be small; for in such a case the 35 per cent. paid by the State and the town would not only cover all the expense outside the railroad lines but would help to pay a part of the cost inside those lines. The railroads' preference for crossings where land damages were light led them to favor improvements in country towns, which appreciated the benefits of the law more than did the cities, so that many country crossings have been changed, while difficult problems in thickly populated districts have continued unsettled, as they do in other States.

The New York law lacks the essential feature of the scheme just described; it leaves the smaller and poorer towns to bear large burdens, and therefore it is not likely to spur them to vigorous action. The payment of an eighth of the cost of the improvement by the State would favor them materially, but yet the lift would be small as compared with the two-thirds or three-fourths diminution which the Massachusetts towns received at the hands of their State Treasurer. It will be seen also that the New York Commissioners have made the railroad burden a little smaller than it is in Massachusetts. While, no doubt, there are many crossings at which the proposed apportionment would be just, it is hardly to be expected that the legislator who seeks the approval of his constituents will vote for any bill which seems to favor the railroads more than any other State favors them.

The changing of grades, even at a few crossings, is a large undertaking, both physically and financially, and merely prescribing a set of rules cannot be expected to have much effect. New York has about four times as many miles of railroad as Massachusetts, and presumably, therefore, about 7,000 or 8,000 highway crossings. To make as good a start as Massachusetts, therefore, the State Legislature should provide a yearly appropriation somewhere about twenty times as large as the sum proposed by the Commissioners. We do not despise the $100,000, but merely state this comparison so that the main feature of the problem may receive suitable emphasis.

Limiting the Size of Freight Cars.

The Trunk Line and Central Traffic Association roads have appointed committees to see about establishing limits to the dimensions of freight cars, and it is believed that the roads west and south of their territory will co-operate with them. That is, it is proposed to put a check to the diversity of sizes as well as to unreasonable lengths, widths and heights. We shall not try to contribute any wisdom to the discussion of this movement, for it is one on which we have no final opinion already cut and dried. The matter is too complicated and comprehensive. We write to call attention to it and in the hope of stimulating a little useful thought.

But we apprehend that the conflict of interests will be so great that no effective action will result. Possible action would be limited to a very narrow field, so narrow that it is doubtful if it would be of much use. It is conceivable that the companies may

agree to fixed limits for cars built to carry grain and general freight. It is not probable, however, that they will agree to stop building big special cars, nor is it probable that they will agree to stop shipping general freight in these big special cars when it is convenient to do so.

The matter may be approached from two sides, that of the traffic department and that of the transportation department, and the present consideration of it comes from the traffic side. Of course, the object is obvious, and it is laudable. The purpose is to put a check to that form of rate-cutting which consists in carrying an extra big carload at the rate based upon the nominal carload. One would suppose that this method of cheating one another and of dodging the ordinary obligations of business honor could be corrected by some simpler method; but, doubtless, a limit to the size of cars would be a help if it could be established.

The transportation department recognizes the numerous inconveniences of a variety of cars, and especially of unusually big cars. About a year ago Mr. Theodore Cooper, incidentally to a study of bridge loadings, made an attempt to forecast the limit of size of freight cars, and his conclusion was that we have got about to that limit. Of course it is fundamental that cars should be built for free transfer from road to road, and established clearances at bridges, tunnels, freight houses, and all sorts of constructions set limits beyond which heights and widths cannot be increased. Mr. Cooper therefore assumes "that radical changes in the width and height of cars are not very probable from the present outlook of clearances." But beyond that, the full cross section of existing car bodies is used for only a small percentage of the freight carried by the railroads, because of the great loads that would be imposed upon the journals and the increase in strength of frame that would be needed if they were loaded to their cubic capacity. He examined the kinds of freight carried on a number of big railroads which handled in a year an aggregate of 153 million tons. Of all this, merchandise was 13 per cent, animal products less than 6 per cent, farm products a little more than 6 per cent. These are the only items of such bulky nature that the carrying capacity of the car in which they are conveyed will be limited by size and not by weight; that is only 25 per cent. of all the freight. But a very considerable part of the merchandise must have been so heavy that a car could not be loaded to its full cubic capacity. "Farm products," by the way, does not include grain, which is in a separate item, and which made 9 per cent of the total shipments.

The point is then that 75 per cent., probably 80 per cent., of all the freight carried is so heavy that the ordinary cars could not be filled up without strengthening the frame and running gear. Furthermore, if cars are built for heavier loads "they must frequently be used for the larger body of lighter freight carried in order to keep up a paying general circulation of rolling stock, and in such cases we have increased the non-paying tonnage, to the detriment of a large body of freight, to benefit another class. The natural tendency must therefore be to get the cars which will be the best suited for the average rather than the heavier freight."

For general purposes then it seems fairly probable that the height and width of cars have about reached their practicable limits. But it does not follow from anything that has been said that they may not be made longer, and certainly we may apprehend that they will be made stronger, and capable of carrying heavier loads; that is, capable of being loaded more nearly to their actual cubic capacity with heavy freights. But there are physical reasons why long cars are troublesome in the transportation department, as for instance a very long car will perhaps rub against a platform on a curve, or two or three very long cars at a freight house will disarrange the spacing of the doors. Furthermore, there are strict engineering limits to the length of a car built to carry heavy loads.

On the whole, we are inclined to think that the various officers of the various railroad companies will insist upon solving their own special problems in their own special way, and building their cars to such sizes as seem to them best adapted to economy and efficiency in handling the traffic which they have to carry; and we question very much if it is for the good of the railroads or the good of the shipping and consuming public that any arbitrary line should be drawn at which the contrivance of the individual should stop. It seems as if the traffic departments ought to be able to meet their difficulties arising from diverse sizes of cars by disciplining their own agents. At any rate, we are very much inclined to think that this is the way in which the matter will work itself out.

Freezing Out Scalpers and Thieves.

The recent action of the New York Central in putting a very short time-limit on its local passenger tickets seems to have been entirely successful. In fact, there was no reason of any consequence, either on grounds of justice or of convenience, why it should not be successful; but as the reporters, echoing the sentiments of the drummers, loudly predicted dire disturbances, it is worth while to note that they guessed wrong. In point of fact not one passenger in 100, perhaps not one in 200, cares for anything but a continuous passage ticket, to be used the same day it is bought, and it is not unfair for these few to submit to some restriction for the sake of the great simplification in accounting that is made possible by making tickets short-lived.

The American plan of collecting tickets and fares is loose at best. This dispensing with gates, locks and red tape is a convenience to the public as well as to the railroads and the public should bear its share of the resultant inconvenienes. Passengers could not rightfully find fault if they had to put up with more red tape than they do. It is no more than right, however, for a railroad to do everything in its power to meet the wishes of the few passengers who do want extra accommodations, especially where such accommodations cost practically nothing and where, consequently, it is impossible to convince the passenger that there is a good reason for not granting them. The stop-over privilege, for instance, often saves the passenger considerable bother, especially where he has two pieces of baggage, only one of which he wishes to use at the stopping-off place. To make him comply strictly with the rules, is to drive him to the express company, which often is too burdensome. Station agents and conductors should be authorized to exercise considerable discretion in matters of this kind. With reasonable passengers it will pay, and if an agent favors drummers or unreasonable passengers too much he should be checked by an inspector. We ought to have more sharp-eyed inspectors. If an agent is not enough of a man to be intrusted with discretion, his is a case for the application of the rule prescribed by Interstate Commerce Commission, in its last annual report, for agents who cannot be trusted to settle simple claims for overcharges on freight. He should be supplanted by a better man.

In fact, the whole success of limited tickets, after making sure that every buyer knows what he is buying, depends upon having agents and conductors who can use good judgment in relaxing the rules where a well-meaning and reasonable passenger breaks them, or complains because he is not allowed to. The New York Central obviates the main trouble with stopovers by issuing tickets in sections. A passenger from Albany to Buffalo wishing to stop off at Utica, Syracuse and Rochester can buy, at Albany, a ticket from Albany to Utica, one from Utica to Syracuse, one from Syracuse to Rochester, and one from Rochester to Buffalo; and can get his trunk checked through to either one of these stations, the baggageman punching the tickets as far as he checks the trunk.

The Delaware & Hudson has also limited its local tickets to midnight of the second day. Railroad officers in the east who think that this idea does not pay, or makes too much trouble, should bear in mind that the principal roads west of Chicago have had it in operation for several years. The Chicago & Alton people, who began in 1892, are particularly well pleased with the plan. On that road every ticket is taken up the first time it is presented, so that passengers have a second reminder, in the exchange check given by the conductor, that their tickets have important conditions. Such a reminder, on the train, after the passenger has calmed down and has ample leisure, is often a good thing. howsoever much printed or verbal warning may have been given at the ticket office.

The Alton road has another scheme that is very effective in checking looseness in the financial part of the conductor's work, and that is the employment of gatemen to see that every passenger entering a train has a ticket. A description of these arrangements on the Alton was published in the *Railroad Gazette* of Nov. 10, 1893. Since then the force of gatemen has been much enlarged, and they are employed on all important local passenger trains of the road in the states of Illinois and Missouri. The platforms of the cars are equipped with gates and the gatemen travel with the train. On approaching a station they lock the door at one end of each car and all passengers have to go out and in at the doors where the attendants are. On a train of three passenger cars two men are employed. They are not under the authority of the conductor, but assist him whenever they can do so. If a passenger asks to go into a train without a ticket he is sent back to the ticket office to buy one, and usually the train waits for him if necessary. In practice there is no delay that causes any inconvenience.

The Alton road increased its ticket sales at once on the establishment of this plan, and the results have continued to be satisfactory. In 1893 the number of local passengers was about 5 per cent. less than in 1892, but the number paying cash fares was 35 per cent. less. In 1892, the number of passengers paying cash was about 10 per cent. of the total number of passengers (other than through); in 1893, the cash fare passengers were only 6.9 per cent. For a part of 1894, as far as we have the figures, the cash fare collections amounted to 2 per cent. of the total passenger earnings (including through and local), whereas in 1893 the the cash collections amounted to 3 per cent. and in the years before that 4 or 5 per cent. or more.

The Mandamus in the Brooklyn Strike.

The most casual observer could not fail to see how the intervention of a court of justice in the Brooklyn street car strike would have a material, if not a decisive, effect in the controversy and probably give victory to that cause which it should espouse. The decision of Judge Gaynor of the New York Supreme Court, on the application for a mandamus against the roads was therefore anxiously awaited by the public as well as the immediate parties to the dispute, and when it came out favorably, in effect, to the companies, the strike was generally thought to have received its death blow. The application was made by a private citizen, who alleged the failure of the companies to run cars at suitable intervals for the public convenience, whereby he was damaged in his capacity as such citizen at large, and particularly in his business, from loss of custom, etc.

Mandamus is an ancient remedy, adhering in old times to the person of the king, as a high prerogative writ, and invariably issued over the sign royal. Afterwards when the king ceased to sit as a judge the prerogative was preserved to the the Court of King's Bench, where by a convenient fiction the king was always presumed to be present, and to exercise his great discretionary prerogatives for the welfare of his subjects, in aid of natural justice, when the ordinary technicalities of the law either wrought, or were unable to prevent, grievous wrongs. Thus there grew up around this extraordinary writ well settled principles regulating its exercise, such as the experience of generations, and regard to the public welfare dictated. In our times, of course, the fictions have all been brushed away, but our great statesmen and lawgivers have not felt justified in disregarding the experience and wisdom of an enlightened people, seconded by our own, in establishing limitations to this extrordinary writ, so as to make it and keep it a useful and timely remedy.

It has always been held that mandamus should not issue when another adequate remedy existed, and only then in cases when the applicant had a clear legal right to redress of a ministerial nature. And over all as a final check to an oppressive use of the writ, its issue was a matter of wise discretion in the courts. The courts have often employed mandamus to compel officers of corporations to do things, not involving discretion, which they clearly ought to do, but have refused to do. What is impossible, or of uncertain accomplishment, or obligation, will never be required under this writ. Disputed facts and rights are referred to other procedures better calculated to determine fairly and fully the matters at issue.

We may thus see in general the conditions upon which Judge Gaynor was at liberty to exercise his discretion in granting the application, if we concede that the subject matter was properly within the scope of mandamus.

We have not before us the allegations of fact set forth in the papers before the court, but we should say that the companies had very indifferent attorneys if they did not photograph for his honor's enlightenment the situation at the time of this application. And if they did, the picture would have shown the companies' lines, abandoned by their large army of employees, estimated to be about 6,000; these men arrayed in hostility all along the road, ready to intimidate and dissuade men set to work in their places; the municipal authorities unable to cope with riotous demonstrations hourly occurring, or to protect the property of the lines, their new employees, or the orderly conduct of their affairs; the presence of the National Guard,

7,000 strong, called out to quell disturbances, and not able to do so without recourse to violence, inflicting bodily punishment and occasionally death—a state of insurrection involving conflicts between armed men, exchange of volleys, charges with the bayonet and the terrible rush of mounted troopers. With these facts before him—and they are not overdrawn—it is astonishing to us that Judge Gaynor could have hesitated over the motion to dismiss the application. Assuming that he had jurisdiction to compel the companies not only to exercise their franchises, but to exercise them in a way that the Court thought proper to direct, it should have occurred to his honor, that the right of the applicant to have this jurisdiction exercised at that particular time could hardly have been clear, or certain of enforcement.

The judge disposes of the case as if it were a mere matter of wages, with which the Court has nothing to do and for which it cares less. And he makes the somewhat startling announcement that the franchises of a corporation must be exercised without regard to the question of dollars and cents. This is far from clear as a matter of justice, and far from settled as a matter of law. The Court of Appeals in a much more comprehensive proceeding than that of mandamus has held that where a railroad company had acquired the franchises of two parallel lines, it did not subject itself to amendment of its charter by abandoning one of those lines in good faith for sound economic reasons, simply because of a fancied wound to the state in its sovereignty.

Moreover, Judge Gaynor entirely overlooked the fact that even if the applicant had established what would have been a clear legal right under ordinary circumstances, yet, after all, the court was to exercise its wise, just discretion whether under the exceptional circumstances then existing it ought to enforce that generally clear legal right. And his honor appears to have overlooked the probability, when he hesitated for twenty-four hours whether he would not grant a peremptory writ, that it could not have been complied with, even if he had issued it. Courts do not make such orders, as a rule, because they are useless and ridiculous.

This idea finally reached the Court in some force, without doubt, for the peremptory writ was denied, and an alternative one granted requiring the companies to resume their usual functions within twenty days, or show cause why they have not done so. It is quite likely that the lines will be able to comply with this direction, and the issue of the writ will thus become harmless, except as a bad precedent. If the companies shall be unable to do this, for reasons that they cannot be properly held responsible for, they can set this fact up by their return, and the issue thus raised becomes a question for a jury to try under proper instructions from the Court. And before the legal controversy can be disposed of, in all human probability the strike will be over, and the result of this trial will be of interest to the public only in a general way.

Perhaps Judge Gaynor was correct in his ruling that, having reference to the simple fact that these companies' lines had the franchises of a common carrier of passengers, and had ceased to exercise them according to the requirements of the public convenience, mandamus would lie to compel a resumption of corporate obligation in the respect complained of. This ground has already been the scene of mighty legal battles, but the general war can hardly be said to be over, in favor of either side, at least in this State. In some instances the battle has been drawn; in others, there has been sometimes an advantage on one side, then on the other. We are not aware that the court of last resort has finally passed on the subject so as to settle the question.

Many years ago the first trust came up in the Court of Appeals, where the judge that delivered the opinion of the court boldly announced that it was not competent by mandamus or any other remedy to compel a corporation to exercise its corporate franchises; that the only redress the people had was to annul the charter and dissolve the corporation. Why should a company, inquired the learned judge, be compelled to carry on forever a business absolutely unprofitable to itself, and perhaps useless to the public? If we concede that a citizen has always and under any circumstances "a clear legal right" to compel resumption of public franchises by mandamus, we lose sight, as Judge Gaynor seems to have done, of the reasonable and beneficent character of this great writ and condemn ourselves to an operation of it under circumstances which would make a bad investment much worse, and a useless one ruinous. This cannot be the law.

Above all these inconveniencies an intervention, unwisely made, though possible as a matter of jurisdiction, is perilously untimely amid scenes of disorder and confusion. The learned judge would of course disclaim any purpose to aid the strikers by any sort of indiscretion, or to stiffen the necks of those who were struggling hard to resist lawful authority. But the hope that he would grant a peremptory writ, justified in a measure, by his first decision and his hesitancy, had the immediate effect to stimulate the mob and justify in a way their opposition to authority, and so, from the mere powers of combination, put the companies at the mercy of those who sought employment from them. Any premises, justifying such conclusions as these, must be unsound. We commend a re-examination of such premises, and if still adhered to by courts of the first instance, it will be well for us all if these matters be brought up for final review in the highest assizes of justice.

The Anthracite Situation.

The demoralization in the anthracite coal trade culminated in November. During that month, which is usually the best of the year in the trade, prices reached their minimum of the year. Stove coal sold from $3 to $3.15 per ton. There was no established price, and almost any figure offered was taken. The price of stove coal in November, 1893, averaged net $4.30 per ton. The primary cause of these low prices was over-production, made through a determination on a part of the majority of interests to keep pace with some few who increased their operations in excess of their agreements, and who, it was feared by the others, would establish a higher percentage than they had theretofore commanded.

This question of percentages has been vital in administering coal trade affairs, ever since the interests have been consolidated in the hands of a few companies. The year's total output is represented by one hundred per cent. There are 11 shipping companies which receive a certain percentage of this amount, the understanding being that they shall agree at the beginning of each month upon the amount to be shipped during that period, each shipper to confine itself to its proportionate share thereof. The natural shifting of business, greater ability displayed by some than others, the opening of new market territory, development of new mines, building of new railroads and the ascendancy of new interests from time to time, have combined to render a change in these fixed percentages desirable.

However, an increase in one company's allotment would naturally mean a decrease in that of some other interest, without the co-operation of which the agreement could not stand. The result has been a wrangle about the first of each year for a decade, which has always ended without much result, and a continual fight during the balance of the year to prevent each interest from turning out more coal than its allotment called for. Certain of the producers, notably Lackawanna, owing to their excellent markets, have been able to steadily increase their output. The other companies, in order to keep pace, have turned out a proportionately greater amount. The result has been a constant pressure upon the market of more coal than it would absorb. The inevitable consequence in this, as in all other cases where the supply is greater than the demand, has been a gradual lowering of prices.

All interests accepted the situation with the best possible grace, while there was a fair profit in the business, but when in November prices sank below the living margin, the owners of the railroad properties, through their presidents, took the matter in hand. The first tangible result was a rigid restriction in the output to trade requirements as a means of temporary relief. This was continued through December, and is the procedure thus far in January. Since the first of December the presidents of the coal roads and their representatives have been engaged in the solution of this very knotty problem of percentages, which directly involves both the question of output and prices. Heretofore numerous attempts have been made in the same direction. However, they were not participated in by all interests. Coxe Brothers & Co. have always assumed a rather independent attitude, while the Pennsylvania Railroad Co. steadily refused to be a party to any restrictive agreement. The present movement, however, was instigated by President Roberts, of the Pennsylvania, and warmly seconded by Coxe Brothers. This had the immediate effect of securing the co-operation of all other shipping interests in an attempt to make an adjustment. It was finally decided by the presidents to form an organization modelled upon the lines of the Trunk Line Association. The matter was referred to the general managers and coal sales agents of the various roads for an arrangement of details. Considerable progress has been made, and before the first of February a report to the President is looked for.

The pooling programme meets with favor, and its adoption is possible. Of course, such a plan would cover only the division of the anthracite shipments between the carrying companies in some agreed proportion. While this would be a gain, it would still leave undecided the question of restricting the supply to the demand, and this latter matter is vital. Traffic pooling would prove an adequate railroad remedy were it not for the fact that two-thirds of the anthracite output is controlled by mining companies owned by the railroads themselves. Deciding merely what traffic percentage each company should have would not alone save either the trade at large or the companies themselves from low prices and demoralization, yet a division of the output might follow. The independent operators, so called, who mine about one-third of the output, assert that they will agree to any plan for dividing the tonnage or for restricting, which shall accomplish the object and at the same time be equitable to all concerned. In their case the payment of 40 per cent. of the tidewater price to the railroads as freight, leaving to the operators the difference, 60 per cent., opens the door to an amicable settlement. Some of the independents have refused to accept such an arrangement, and with these it may be difficult to deal. Reperesentatives of the large companies take the broad view that the best way to handle producers who refuse to co-operate is to charge as high a freight as possible, making their profits through this medium, and curtailing their own production so as to keep the total shipments within the allotment.

The year 1894 was exceedingly bad for the trade. Two of the leading companies have just made annual reports. Reading confesses a loss in the price derived for coal of 23.7 cents per ton, as compared with the average selling price of 1893, while Lehigh Valley reports a loss of 70 cents per ton. The year's experience and returns have created the very positive feeling that there is more money for the trade in producing 40,000 000 tons at an average price of $4 per ton, than 44,000,000,000 tons at $3.25 per ton. This will go a long way toward bringing to a satisfactory termination negotiations now in progress.

Proposed Legislation.

"No sun ever shone more brightly than the sun of reform now blazing all over our country." This is one of the gems that we find in a speech by Senator Reuter, in the Colorado Legislature, during a recent discussion in that body concerning a proposition to follow the example of New York State in prohibiting the use of railroad passes by public officers. With the first part of this noble sentiment we can fully agree (provided the honorable Senator is right as to the facts). But when such an effulgent luminary blazes in 30 or 40 States at once, an editor may be pardoned if he becomes somewhat discouraged. The number of bills affecting railroads presented in the various legislatures is so great that we can neither keep track of them ourselves, nor have the face to burden our readers with a list of them. We omitted mention of this subject last week on account of the multiplicity of items, all of which seemed to be of doubtful importance; and after waiting a week longer the only change is an increase of confusion. We therefore present as brief a summary as possible, omitting a good many bills and resolutions which deal with minor matters, or which are so absurd on their face that there is no likelihood of their succeeding, even in a modern American legislature.

Commissioners. In Illinois it is proposed to have the Railroad Commission fix rates for the express companies; in South Dakota to give the Board full powers to fix freight rates; and there is another bill reducing the salaries of the commissioners. In Tennessee and West Virginia a commission is proposed.

Employees. A law prohibiting blacklisting is proposed in Illinois, one to pay employees weekly in New Jersery, and one requiring licenses for locomotive engineмen in Texas. In Massachusetts a member has presented the old proposition to require railings on freight car roofs, to keep men from falling off. Bills for arbitrating labor disputes are proposed in Illinois, Minnesota and Wyoming.

Passes. This is the subject on which the sun of reform blazes hottest; and, as Mr. Reuter says, "It is penetrating the dark places of official life;" but he does not state whether any pockets have yet been actually turned inside out. Laws prohibiting the use of railroad passes by public officers, phrased in language of varying degrees of severity, are proposed in Alabama, Indiana, Kansas, Missouri, North Carolina, Tennessee, Texas and Wisconsin; while in New York the members are busy with schemes to get around the law already passed.

Rates, Passenger. In Connecticut there is a bill to reduce all passenger fares to one cent a mile, and to introduce the zone system. In Massachusetts, New York and Indiana it is proposed to make all two cents a mile. In New Hampshire and South Dakota there are bills requiring thousand-mile tickets to be sold, at prices named in the bills, which are very low. In Wyoming, the proposition is to reduce everything to three cents. California has an anti-scalper law under discusson. A bill to reduce sleeping car rates to 80 cents has been presented in the New York legislature; similar bills are up in the States of Pennsylvania and Washington.

Rates, Freight. A bill to regulate freight rates has been presented in Kansas. Kansas is one of the States that has regulated rates to death already.

Taxation. A bill to increase the tax on sleeping cars has been presented in Wisconsin; and in North Dakota there is a committee to confer with representatives of Minnesota, Montana and Washington on this subject.

Wreckers. Bills to punish train wreckers or robbers by death have been presented in Arkansas, Colorado, Missouri and Texas.

There are a few bills bearing some marks of novelty. In Minnesota a law to guard against forest fires makes it the duty of railroad employes to report and extinguish fires, under a penalty of $100 fine, half the fine to go to

the informer. In Massachusetts there is a demand that the Board of Inspectors of Railroads, established a year or two ago, shall be changed in its constitution and its powers. In Missouri the use of gates on passenger trains, which compels passengers to buy tickets, still offends the citizens of that State, and Representative Grubb has presented a bill prohibiting the use of gates.

If there is any one State which is stirring up things more effectively than another, it is North Carolina, where the populists are revelling in new found power, and we must give it a separate paragraph. A correspondent in Raleigh says that

"Several bills affecting railroads have been introduced in the legislature during the past week, among them one imposing a penalty of $10 a day for holding over perishable freight over two days; one to abolish the present railroad commission of the State, and one to compel railroads to accept unused excursion tickets on subsequent regular trains in certain cases. The bill abolishing the railroad commission will pass, but the present law will be re-enacted, the object being to displace the present democratic commissioners, and elect populist republicans in their stead. Another bill which has passed the Senate by a vote of 39 to 6, and will undoubtedly pass the House, provides that a railroad holding non-perishable freight over five days and perishable freight over two days shall be liable in an action for debt for twice the value of the freight, and $10 for each day over the time above stated freight is delayed, in the case of non-perishable freight, and $25 a day for perishable freight."

The only fault we have to find with this law is that it does not also apply to freight *not* held over. The people can never be really happy until each shipper gets a premium of a ten dollar silver certificate from the freight agent on delivery of his shipment.

Chicago papers publish an account of the annual report of Street's Stable Car Company from which they show that the gross earnings of the concern for the year 1894 decreased $93,244, and that operating expenses increased $6,669, but that still the net earnings amounted to $141,814; and the company now has on hand a surplus of $352,129. The reporter naturally concludes that the business of supplying the railroads with private stock cars continues profitable. The report shows:

Receipts:	
Gross earnings from mileage	$417,482
Maintenance and operating expense	165.168
Net earnings from mileage	$252.315
Miscellaneous receipts	26,716
Net income	$279,031
Disbursements:	
Interest on current notes	$17 218
Interest on bonds	70,000
Sinking fund	50,000
	$137,218
Net profits for the year	141 813
Paid dividends	92,731
Net surplus	49 082
Balance Dec. 31, 1893	303,046
Balance Dec. 31, 1884	$352,129

Comparative Statement for 1893 and 1894:

	1894.	1893.
Gross earnings	$417,484	$527,714
Miscellaneous	26,716	9,730
Total	$444,200	$537,444
Expenses	165,168	158,499
Total	$279,031	$378.955

And there are numerous other car companies whose profits pile up on a similar scale. The percentage of expenses to earnings here shown is only 39, and the net earnings are more than three times the sum necessary to pay interest on bonds and car trust notes. The railroad manager who hires private cars and who has to sit up nights to keep the expenses of his own road below 75 per cent. of the receipts, must find "food for thought" in these figures.

At least one railroad superintendent is not above going into specific details when he addresses passenger trainmen on the subject of neatness of personal appearance. This is Mr. Robeson, of the Boston & Albany. He has suddenly waked up all the newspaper paragraphers within a hundred miles, by telling his conductors that their brakemen must raise their standard of appearance a little, adding as an incidental hint that "a man with two days' growth of beard on his face cannot look neat." We are not sure but this is a trifle hard on the fair-haired men, who, by keeping at a proper distance, can present a respectable face for a considerable time beyond the 48-hour dead-line; but the principle is sound. There are those who will ridicule this, in spite of the world-old fact that the man who has enough self-respect to wash his face, and stand up and button his coat is the best man for any use; and in spite of the more modern observation that the dandies win the battles; and there are men who will "kick" about it. But we remind them that practically just such a rule has prevailed for years in the sleeping car service; and it has been in force, in a sense, on all the best roads, for those men who have voluntarily complied with it have been preferred in making promotions. Indeed, it is to point out the inadequacy of this half-way measure that we mention Mr. Robeson's order. In the course of five or ten years it is possible to improve the appearance of your brakemen by simply taking care in making appointments, as the slovenly ones will die or resign; but this plan is seen to be really absurd, when we reflect that the same end can be accomplished in six months, as well as in six years, by using a little tact and sense. Often the most efficient brakeman are those whose early habits of dress and manners have been a little rough, and it is a pity to let them leave the service for lack of a gentle hint to "brace up." The superintendent generally can take his choice between employing spruce and civil men, and making brakemen of them, and employing *brakemen* and making them genteel. Often the latter may be the best way. Certainly we are not yet ready to adopt the view expressed a few years ago by a well-known superintendent (of a large road) that passenger brakemen are now nothing but porters to assist ladies and children, and that a dude will fill the position all right after a few weeks' training. It is still desirable to have in this position the experience that men get in the freight service.

A very striking illustration of the illuminating qualities of acetylene may be seen at an office on lower Broadway, New York. That this hydrocarbon has great illuminating value has long been known; but for several reasons, particularly the cost of producing it, it has hitherto not been utilized commercially. Recently a method has been discovered of producing calcium carbide by reducing a mixture of powdered lime and anthracite coal in an electric furnace. When this calcium carbide is wetted with water an acetylene gas, giving a light of wonderful brilliancy, is evolved. Some extensive experiments have been made at the Schenectady works of the General Electric Company in the production of calcium carbide, and it is believed by many persons, gas engineers and others, that the process is so developed now as to make it certain that this product can be delivered at a price which will make it an extremely important element in gas making. If the hopes of those who control the patents under which these experiments have been carried out are realized this new source of illuminating gas will be employed for isolated plants of all sorts, including railroad cars among others. Another way in which it is likely to be employed, if it proves to be practicable, is to enrich common coal gas.

The Nicaragua Canal bill passed the Senate last Friday by a vote of 31 to 21. A few amendments were accepted and become a part of the bill, as it has passed the Upper House. These require all material for the canal to be bought in the United States; give the President power to remove any of the directors appointed by him; declare that no more than one dollar in stock of the company shall be issued for every dollar expended; require contracts to be let to the lowest bidder, limiting the entire amount to $70,000,0000; require the Government directors to be citizens of the United States, and that no contract shall be made with any company in which any stockholder or director, or the Maritime Canal Company is a member or director, or in any way interested. Mr. Peffer offered an amendment that all laborers should be citizens of the United States, and that eight hours should be a day's work. This was rejected. The possible fate of the bill in the Lower House we do not speculate on.

The old House of the Institution of Civil Engineers in Great George street, London, has been nearly all demolished and will be rebuilt for use in the session of 1895 and '96 from the designs of Mr. Charles Barry. *The Engineer*, of Jan. 18, publishes some excellent engravings, giving a floor plan, sectional elevations and a perspective view of the façade, and takes the occasion to give a short history of the Institution. The engravings show a library 30 ft. x 87 ft. with an additional library 24 ft x 40 ft. and a theatre 40 ft. x 60 ft. No plans of other floors are given. We would call the attention of those members of the American Society of Civil Engineers who are thinking seriously of a new house for the Society to the article in *The Engineer*.

TRADE CATALOGUES.

Comfort in Travel.—Michigan Central Railroad.—The G. P. A. pegs away with untiring energy and unabated invention. One of the latest and most attractive examples of his work is a little book issued by the Michigan Central and printed by Rand, McNally & Co. It is bound in muslin with beveled edges, printed on heavy calendered paper, with gilt edges, has a colored frontispiece and vignettes scattered all through the text, printed in sepia.

The literary part consists of but about 40 pages, and those very small, but all attractively written, with the ornamentation of quotations from various authors in various languages, and with the customary little flourishes and graces with which the "literary feller" loves to adorn his work. As the reader may suspect from the title, the object of the writer is to show that comfort and even luxury abound on the Michigan Central, and to that end he takes us a journey over that road, beginning in the colossal new station at Chicago, various pretty views of which are given. We then come East in a day coach, sleeping car and dining car, which enables the artist to bring in the Michigan Central flower girl, the Detroit transfer boat and other matters peculiar to the Michigan Central. Of course, Niagara Falls is not neglected either by the author or the artist, nor is the Hudson River; and we are even taken on a very short excursion into New England. The volume winds up with condensed through time tables, East and West, and a little special information.

Illustrations of Files, Rasps and Tools.—Nicholson File Co., Providence, R. I.

Under date of Dec. 15, 1894, the Nicholson File Co. sends out a very handsome illustrated catalogue. It shows in full size engravings, carefully drawn, the Nicholson increment cut files and rasps, the Nicholson X F files, as well as many tools and specialties manufactured by the company. There is also an account of the creation of the present plant and facilities of the company and a description of its product. The files shown are remarkable in variety and completeness, and of course, their quality is now a matter of common record. Price lists are also given.

Keuffel & Esser Co., New York, manufacturer and importer of drawing materials and surveying instruments, has just issued its 1895 catalogue and price list. This is the twenty-sixth edition and contains an unusual amount of new matter; it is not a reprint from former ones, but has been rewritten and enlarged by more than 100 pages. The entire book is copyrighted and about 400 illustrations and much of the descriptive and explanatory matter have been copyrighted separately. The book in addition to being a very complete catalogue and price list of the goods sold by the company, contains a short treatise on drawing paper, useful hints about drawing instruments, planimeters and similar instruments, description of the progress of surveying instruments, an illustrated paper on verniers and their application, colored details of improved graduating leveling rods, directions for reading elevations by aneroids, explanations about field glasses, etc. Distributed through the catalogue are a number of views, reproduced from photographs of the several departments of the company's store and factories. At the end is quite a list of scientific books, followed by an index.

Car Heating Apparatus.—Safety Car Heating & Lighting Company, 160 Broadway, New York.

The new catalogue of this company shows the standard system of heating by water circulation, both single and double circulation, also the direct steam system and the company's system of regulation and various special fittings, as the Pennsylvania Railroad steam coupler, the Gibbs coupler, the Safety straight port coupler, the Safety automatic steam trap and locomotive equipment for steam heating.

The Stow Flexible Shaft.—The Stow Manufacturing Co., of Binghamton, N. Y., has just issued its catalogue No. 5, being illustrations, description and price list of various applications of the Stow flexible shaft and also of various special tools made by the company, especially for use with the flexible shaft, some of which are new. The catalogue gives valuable information as to the uses of the flexible shaft.

Creosoting by the Dead Oil of Coal Tar Process.—The Eppinger & Russell Co., issues a pamphlet describing its plant and process for creosoting timber by the dead oil of coal tar process, showing specimens of timber treated and giving some record of results. In a general way the pamphlet is an interesting and useful addition to the information upon this subject available in print.

Lunkenheimer Specialties.—The Lunkenheimer Company, of 11-17 East 8th street, Cincinnati, O., has just issued its 1895 illustrated catalogue and price list of specialties. Pretty nearly everybody knows what these specialties are; that is, valves in great variety, whistles, gages, cocks and all manner of lubricating devices. The catalogue, as usual, is beautifully printed.

The Auto-Pneumatic Railway Signal Co., of Rochester, N.Y., has issued a handsome and very complete catalogue of its interlocking apparatus for railroad signals. This apparatus, which was described in the *Railroad Gazette* of Dec. 22, 1893, is operated wholly by compressed air, this force being used both as the power for moving the signals (and derailing switches) and as a means of transmitting it from the tower to the signal. There is no electrical apparatus whatever, and no manual power is required except to turn the air valve. The catalogue gives very clear descriptions of the different devices made by this company, with good drawings of the principal features. Detailed figures are given, showing the amount of air and the degree of pressure required, substantiating the claims of the company that the cost for compressing is very light, and that the pressure used is so low that there is no trouble from condensation of moisture or from freezing in cold weather.

A Year of the "Alley" Elevated Railroad.

At the annual meeting of the stockholders of the Chicago & South Side Rapid Transit Company, the report of the President, Mr. Marcellus Hopkins, confirmed the belief that the road had not earned enough during the past year to pay the interest on the funded debt, but the deficit was much larger than had been expected.

Financial statement for the year was as follows:

Earnings—	
Passenger	$679,381.29
Other sources	20,773.33
Miscellaneous	11,529.89
Total	$711,684.51
Expenses—	
Maintenance of way and structure	$ 42,691.83
" " rolling stock	26,975.35
Conducting transportation	405.853.98
General expenses	76,289.55
Taxes	16,750.37
Total	$568,561.08
Net earnings and receipts	143.123.43
Interest on funded debt	$525,000.00
Balance deficit for 1894	381.876 57
Balance surplus for 1893	325,183.20
Net deficit, Dec. 31, 1894	$ 56,693 37
Traffic Operations—	
Train miles	1,229.957
Car miles	5 182.598
Passengers carried	13,587.791
Average cost per passenger	$0.0419
Operating expenses, per train mile	.462
" " " car "	.109

From this statement it is shown that the road was operating at a loss of $1,046.23 a day, when the total expense, including interest, is considered. Of course, no comparison can be made with 1893, on account of the unusual conditions of that year, due to the World's Fair traffic.

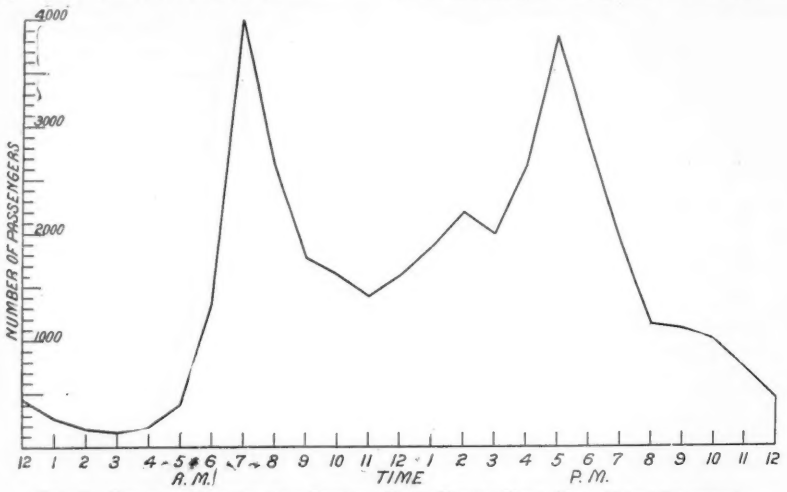

Fig. 2.—Diagram Showing the Average Daily Traffic Each Hour (Alley Elevated).

The line now consists of 8.56 miles of double track, and 1.5 miles of sidings, making a total length of track of 18.62 miles, all of which is laid with 90 lb. rails. The rolling stock consists of 46 locomotives, 180 passenger cars, and 1 supply car.

The capital stock is $7,500,000, and funded debt $10,500,000, making a total of $18,000,000.

This year, 1894, is the first that the road has been operated in its normal condition, and the results cannot be compared with previous records.

Figure 1 shows the total number of tickets for one year, 1894, sold at the different stations. Cottage Grove avenue station is at the Washington Park Club race track, and is where the elevated crosses the Cottage Grove cable line at Sixty-third street. The Forty-third street station is in the stock yards district. Figure 2 is a diagram showing the average number of passengers for each hour during a day.

The following table shows the distribution of the average daily earnings and expenses, from which a comparison with the New York and Brooklyn Elevated roads will be made:

	Average Daily.
Earnings—	
Passenger	$1,861.32
Rentals	21.95
Privileges	34.44
Miscellaneous	.52
Total	$1,918.23
Expenses—	
Maintenance of Way and Structure—	
Repairs of roadway	$25.24
Renewals of rails	.24
" " ties	
Repairs of structure	26.17
" " buildings	31.98
" " tenements and dwellings	8.64
Maintenance of Electric Light	24 66
Maintenance of Telegraph	.03
Total	$116.96
Maintenance of Rolling Stock—	
Repairs and renewals of locomotives	40.46
Repairs and renewals of passenger cars	32.19
Repairs of machinery and tools	1.25
Total	$ 73.90
Conducting Transportation—	
Engineers and firemen	218.17
Hostlers, wipers and tenders	27 85
Fuel for locomotives	396 35
Water for locomotives	23.17
Oil, waste and tallow for locomotives	9.01
Other supplies for locomotives	1.67
Expense of telegraph (including despatchers and operators	19.53
Conductors	68.46
Guards	87 05
Yardmen, switchers and couplers	40.25
Inspectors, cleaners and trimmers	23.94
Pintsch gas for cars	20.62
Oil, waste and tallow for cars	1.19
Other train supplies	1.91
Station agents	86.38
Gatemen and platformmen	47.29
Porters and laborers	24.41
Watchmen	5.23
Station supplies	9 45
Total	$1,111 93
General Expenses—	
Salaries of general officers	41.19
Salaries of clerks	29 38
Stationery and printing	8,45
General office expenses and supplies	13.85
Legal expenses	34 53
Personal injuries	11,75
Advertising	.52
Insurance	4.02
Rent of buildings	40.18
City tax on cars	25.14
Loss and damage	.01
Taxes	45.89
Total	$ 254.81
Grand Total	$1,557.70

Percentage of Expense to Earnings (including Taxes).....81.2
Percentage of Expense to Earnings (not including Taxes).....78.8

In order to compare these yearly expenses with those of the Manhattan Elevated of New York, the Kings County, and Brooklyn Elevated roads of Brooklyn, they are collected in Table A, and the relative percentages obtained.

In comparing these figures it must be remembered that the cost of fuel for the Alley Elevated is much higher than if the coal had been the same price per ton in Chicago as it is in New York or Brooklyn. The price per ton paid by the Alley Elevated is $6.00. Also the per cent. of the general expenses is much higher, due to the comparatively small traffic of the Alley Elevated, as compared with the Manhattan. On the whole, the comparison with the New York and Brooklyn elevated roads is not an unfavorable one to the Alley Elevated.

The monthly earnings of the road showed a continual decrease from January, 1894, when they fell below the operating expenses, until the month of August was reached, and since then they have increased each month, as shown by the following table:

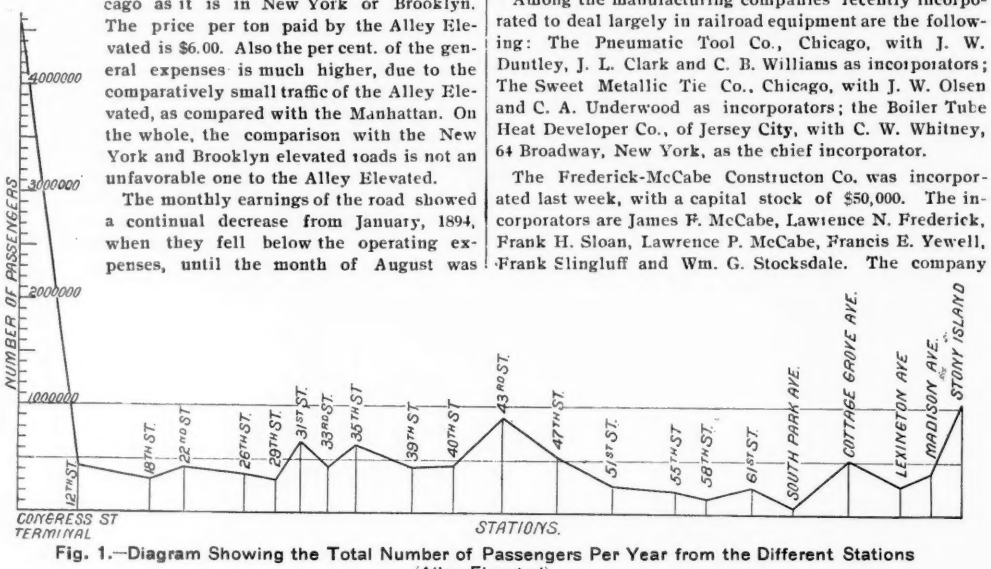

Fig. 1.—Diagram Showing the Total Number of Passengers Per Year from the Different Stations (Alley Elevated).

Months.	Earnings.	Expenses.	Percentage of Expenses to Earnings.
January	$62,377.95	$63,669.25	102.1
February	54,242.80	52,935.63	97.2
March	62,421.17	51,011.41	81.7
April	60,152.18	46,899.82	78 0
May	57,972.97	47,310.83	81.6
June	53,366.55	44,179.97	82.6
July	56,537.87	45,636.32	80.7
August	50,252.52	39,342.02	78 3
September	50,558.79	38,381.31	75.9
October	60,490.77	46,429.92	76.8
November	61,472.43	45,161.14	73.5
December	70,308.62	47,603.46	67.7
Total	$700,154.62	$568,561.08	81.2

An agreement has been entered into by the Union Elevated Railroad Company with the Alley Elevated, the Lake street Elevated, and the Northwestern Elevated roads, whereby the Union shall build a down town loop and rent it to the other three for joint use.

The question of an extension to Englewood has been dropped until the construction of this loop is assured. Also about the matter of equipping the road electrically nothing will be done until the experience of the Metropolitan is learned.

TABLE A.—PERCENTAGES OF WORKING EXPENSES OF ELEVATED RAILROADS.

Name of Road.	Maintenance of Way and Structure, including Repairs of Track, Structure, Stations, Shops, etc.	Maintenance of Equipment, Repairs of Locomotives, Motors, Cars, Central Station, Machinery, Tools, etc.	Wages of Conductors, Guards, Motormen, Engineers, and Firemen.	Fuel.	Wages of Station Agents, Gatemen etc.	Oil, Waste, Water Supply, Station Supplies, Wages of Flagmen, Switchmen, Signalmen, and other expenses of conducting transportation	General Expenses, including Salaries, Supplies for General Office, Stationaries, Printing, Advertising, Legal Expenses, Damage to Property and Persons, Telegraph Maintenance and Operation, and further general expenses.
"Alley Elevated," Chicago	7 5	4 7	24.0	25.4	10 2	11.8	16.4
Manhattan Elevated, 1891	11 2	12 6	27.4	15.8	10.0	13 1	9.8
Kings County Elevated, 1891	4 3	7.6	25 8	21.9	14 7	10.0	15.7
Kings County, Elevated, 1892	4.4	8.6	26.2	21 1	14.7	9.7	15.4
Brooklyn Elevated, 1891	2 8	7.5	30.1	25.1	15 7	13.0	6 0
Brooklyn Elevated, 1892	4 1	9.2	29.3	22.3	15 4	12.9	6 9
Brooklyn Elevated, 1893	4 7	9 8	27.9	22 6	14.5	12.5	8.1

TECHNICAL.

Manufacturing and Business.

The Blackmer & Post Pipe Co., of St. Louis, large manufacturers of sewer and culvert pipe, has recently taken over the business of the St. Louis Sewer Pipe Co., of that city.

The Massachusetts Car Co. has been organized at Saco, Me., with a capital of $300,000, to manufacture cars and railroad supplies. G. A. Hilton, of Milton, is President, and W. G. Wheddon, of Stoneham, Treasurer.

A number of postal cars are to be equipped with the electric lighting system of the American Railway Electric Car Lighting Co., of Philadelphia. The company uses a storage battery and a dynamo driven from the car axle for lighting cars.

The incorporation of the Railroad Gate Co., of Buffalo, N. Y., to manufacture the Wilder Railroad crossing gate, was noted last week. The directors are M. Wilder, formerly Roadmaster of the New York Central; R. C. Hickok, of Trout & Hickok, Dr. J. N. Goltra, J. K. Eckert, Loren F. Boies and Thomas Eickenson, of Buffalo.

Mr. Edward T. Canby, partner of the late Mr. Reginald Canning, will continue the railroad equipment business under his own name at 421 Chestnut street, Philadelphia, and 115 Broadway, New York. He will also represent the Seidel & Hastings Co., of Wilmington, makers of old-fashioned charcoal iron for boilers and locomotive fireboxes, and of plate iron generally.

Among the manufacturing companies recently incorporated to deal largely in railroad equipment are the following: The Pneumatic Tool Co., Chicago, with J. W. Duntley, J. L. Clark and C. B. Williams as incorporators; The Sweet Metallic Tie Co., Chicago, with J. W. Olsen and C. A. Underwood as incorporators; the Boiler Tube Heat Developer Co., of Jersey City, with C. W. Whitney, 64 Broadway, New York, as the chief incorporator.

The Frederick-McCabe Constructon Co. was incorporated last week, with a capital stock of $50,000. The incorporators are James F. McCabe, Lawience N. Frederick, Frank H. Sloan, Lawrence P. McCabe, Francis E. Yewell, Frank Slingluff and Wm. G. Stocksdale. The company will do a general constructing business, including electrical work and power plants. Mr. Lawrence N. Frederick will be President, Mr. L. P. McCabe, Manager, and Mr. F. H. Sloan, Consulting Engineer.

At the annual meeting of the stockholders of the Harvey Steel Car Co., held last week, the following directors were elected: N. K. Fairbank, Granger Farwell, A. G. Spalding, T. W. Harvey, F. H. Revell, D. B. Lyman, G. B. Shaw, George P. Jones and Morris Sellers. The only change from last year was the substitution of George P. Jones for W. D. Preston. An issue of $100,000, six per cent. gold bonds, to meet the present liabilities of the company to be offered to stockholders at 95, was authorized.

All the creditors of the Pennsylvania Steel Co. have assented to the plan of reorganization. The affairs of this company and the Maryland Steel Co. are now in the hands of the Reorganization Committee, and are in a fair way for settlement in the near future. The matter is before the Master appointed by the Court, and in a short time his report will be made to the Court, when the proper decree will be issued, the sale effected, and, after the necessary legal requirements are complied with, the new company can then take charge of affairs and the Receivers be discharged by the Court.

The Ajax Metal Co., of Philadelphia, manufacturers of the Ajax journal bearing, will hereafter be represented in the Southwest by the Missouri Car & Foundry Co., of St. Louis under an agreement recently made.

The Berlin Iron Bridge Co., has closed its Purchasing Agent's office in Philadelphia and hereafter all purchases for the company will be made from its general office at East Berlin, Conn.

Iron and Steel.

At the annual meeting of the stockholders of the Cambria Iron Co., held recently at Philadelphia, the following were re-elected directors: Josiah M. Bacon, A. J. Drexel, Jr., Robert F. Kennedy, James McMillen, David Reeves, Powell Stackhouse, John W. Townsend, John Lowber Welsh, R. Francis Wood.

The Johnson Company's steel rail mill, at Johnstown, Pa., shut down on January 27, and this week a large force of men was put to work tearing out the machinery and loading it on cars for shipment to Lorain, O., where the company is building a great steel rail plant. The vacated building will be used for other purposes at an early date. The switch works, which are the most extensive of the

Johnson Company plant here, will not be removed, but, in all probability, considerably enlarged.

The new plant of the Ohio Steel Co., at Youngstown, O., is ready to be started up, and this will probably be done within a few days. It is expected to start the plant to make billets of all sizes, and sheet and tin plate bars. The plant is built with the intention of ultimately making T rails and structural steel. The output will be from 1,000 to 1,500 tons a day.

The Illinois Steel Company's works at Joliet, Illinois, are shut down, and 1,000 men are idle in consequence of the refusal of about 40 tonnage men to accept a reduction of wages.

The billet mill of the Pennsylvania Steel Works resumed last Monday, after an idleness of seven weeks, giving employment to 100 men. The blast furnace, which has been idle for a year, will be blown in during the week. All the departments of the works will run this week.

Signaling Contracts.

The National Switch & Signal Co. has been awarded the contract for furnishing signaling apparatus at Kenova, W. Va., at the crossing of the double main track of the Chesapeake & Ohio with the Norfolk & Western. This company has also been awarded the contract for furnishing standard station block signals for the Chesapeake & Ohio. It has recently completed some changes in the 80 lever interlocking machine at 43d st., Illinois Central, Chicago. These changes having been made necessary by the rearrangement of the tracks at that point. The company has recently received an order for interlocking the crossing of the Indiana, Illinois & Iowa with the Lake Shore & Michigan Southern, at South Bend, Ind. The machine will consist of 14 working levers operating six switches, six F. P. locks and ten signals.

Piper-Burrowes Patent Litigation.

The interference proceeding, which has been pending in the Patent Office for several months between E. E. Piper, Treasurer of the Davis Car Shade Co., and E. T. Burrowes, President of The E. T. Burrowes Co. (manufacturers of the Burrowes car shade), both of Portland, Maine, was finally settled by the Commissioner of Patents, Jan. 11, in favor of Mr. Piper. In his decision, the Commissioner rules that Burrowes' claims are not patentable. This dissolves the interference and settles the suit. S. W. Bates, of Portland, and Marcellus Bailey, of Washington, appeared for Piper, and L. S. Bacon, of Washington, for Burrowes.

THE SCRAP HEAP.

Notes.

A passenger train of the St. Louis Southwestern was stopped by robbers near McNeil, Ark., on the night of January 24. A considerable amount of money was taken from the express car.

The cases of E. V. Debs and his associates came before the Supreme Court of the United States last week, and they were admitted to bail in $2,000 each. The hearing on the technical legal points involved was not finished, but the prisoners, 16 of them, were taken out of jail at Woodstock, Ill., and their trial for conspiracy before a court and jury was begun at Chicago.

The Canadian controller of customs has issued an order forbidding collectors and other officers connected with his department accepting passes from railroad corporations.

Severe snowstorms prevailed throughout a large section of the country last week. There was a depth of 3 ft. in Northern New York, and trains of Rome, Watertown & Ogdensburg were stalled at many places. There were two collisions between passenger trains and snow plows. There was snow and high wind in all the central States, and in Iowa, Kansas, Missouri, and even farther south. The temperature was below zero in Oklahoma. Trains were blocked by snow near Mexico, Mo.

The United States District Court in Oregon has denied the application of employes of the Oregon Railway & Navigation Co., for an injunction to restrain the Receiver from reducing their wages. The Florida, Central & Peninsular has reduced wages 10 per cent., chiefly on account of the falling off in earnings, due to the freezing of the oranges. The employes of the King's County Elevated Railroad in Brooklyn, N. Y., such of them as have recently suffered a reduction, will receive 10 per cent. additional wages for the last half of January, the company making this addition on account of the increase of business, consequent upon the stoppage of surface car lines.

Gossip About the Brotherhoods.

Since January, 1894, 131 lodges of the Brotherhood of Locomotive Firemen have become defunct. This means a falling off in membership of over 4,000, to say nothing of individuals who have withdrawn everywhere throughout the country. The International Trackmen's Union is dead, and the Switchmen's Mutual Aid Association is little more than a nominal organization. Grand Master Miles Barrett has secured a job, and is now switching cars in the yards at Kansas City. The Brotherhood of Railway Carmen has gone to pieces. John Bowie, head of the Trackmen's Union at Battle Creek, Mich., has been as inactive as the grand master of the Carmen. The same sad story may be told of the Order of Railway Telegraphers. Not over 5,000 members are now in good standing, and many lodges have surrendered their charters. Ex-Grand Chief Thurston is practicing law at Lathrop, Ia., and Ramsay is following the same profession in Chicago. Between November, 1893, and the present time, the Brotherhood of Locomotive Engineers has lost over 8,000 members. This is partially due to hard times. Several charters have been surrendered, and the membership is on the decline. There is war between the Eastern and Western engineers over the grand chief, who has for years been objectionable to the Western men. In the ranks of the Brotherhood of Railway Trainmen, 145 lodges have become defunct within the year, and returned their charters. This means a loss in membership of nearly 4,000 besides the withdrawals from lodges which are still in good condition. The Trainmen's Journal is the only official organ of any organization named that has had the honesty to strike the names of defunct lodges from the directory which is published monthly. The Order of Railway Conductors has suffered a proportionate loss.—*St. Louis Globe-Democrat.*

The New Western Maryland Station in Baltimore.

The Western Maryland Railroad Company is to build a new station in Baltimore, where its tracks cross West North avenue, at Walbrook, a growing suburb of the city. The site was recently purchased, and plans are being made for the building. It will be about a mile west of Union Station, and will be convenient to all parts of Northwest Baltimore, by means of the several street railroad lines. Several reasons have prompted the company to take this step. The chief one was to avoid carrying passengers through the Baltimore & Potomac tunnel. By the terms of the agreement entered into between the Western Maryland and Pennsylvania railroad companies May 1, 1875, the former pays 10 cents for each trip passenger carried through the tunnel, and six cents and four cents each for those traveling on excursion or commutation tickets respectively. These charges with the tonnage fees on freight, cost the Western Maryland Company about $80,000 each year. Passengers now land at the Union Station in the northern part of the city, or at Hillen Station in Old Town, both remote from the business section. When the new station is built passengers can leave the cars west of the tunnel, and arrive at their places of business more readily than to ride further into town. Moreover, a traffic arrangement between the railroad and the street car companies may be effected, by means of which a ticket coupon would give a free ride from Walbrook Station into the city. In this way the Western Maryland people estimate a saving of $2,5000 annually on the Baltimore & Potomac tunnel charges, besides saving passengers the unpleasant necessity of riding through a long and damp underground passage choked with steam and smoke. The recent consolidation of the Lake Roland Elevated Railroad with the City & Suburban lines will greatly facilitate this arrangement. A second track probably will be laid next summer on North avenue, to accommodate the increased traffic of the consolidated lines, and by the time the new Walbrook Station is completed, passengers over the Western Maryland can be distributed from that point much easier than from either of the other stations, and the management will be in position to offer inducements to passengers to leave the cars before the train enters into the tunnel.

Street Car Transfers in Baltimore.

The transfer system among the street railroads of Baltimore has grown since its introduction in 1882, and free transfers are now issued at some 40 different points; in some cases it is possible to ride 20 miles for a single fare. As a rule, in any city transfers are confined to different lines of one company; but at a crossing of the Lake Roland Elevated and Central roads free transfers are given from one to the other. A station is located at the junction and an agent provides the transferring passengers with a ticket. At the end of each quarter officials of the two companies meet, exchange coupons and divide equally the residue of fares collected by one company over the other. It is a very simple arrangement, and has resulted in greatly increasing the traffic of both roads.

Lake Notes.

Since the last week there have been two contracts let for lake shipping of special importance. These are for a second 405 ft. ship of steel, to be built at the Chicago yards, for a syndicate composed of vessel owners and iron men of Duluth and Cleveland, and for a ship of 400 ft. less length for the same parties. They add 11,000 tons to the shipping under contract, as noted last week. The two will cost about $440,000. They are to be out by the middle of summer.

The American Steel Barge Co., of Superior, is figuring on two or three steel tow barges of the ordinary type, for one of the Cleveland vessel firms. It is safe to say that these boats will be built by the Barge Co. for little profit, if at all, for all the material entering into their construction will go by rail freight from the Pittsburg mills to the west end of Lake Superior at no little cost.

There are 10,000 men at work in the iron mines of the Lake Superior region at this time; of this total a third are on the Marquette and Menominee ranges, 2,400 on the Gogebic, 1,500 on the Vermillion, and the rest on the Mesabi. This is about two-thirds a full force, figuring on the number employed before the panic.

The receivers of the Penokee & Gogebic Consolidated Co., owned in New York, have been granted permission by the United States courts to mine not more than 750,000 tons at the Tilden mine, and will get out about 500,000 tons at the Aurora and Ashland mines. Probably their entire business for the year will be about 1,000,000 tons. They have thrown up the leases of four of their mines.

A contract for a very large steel steamship, to be 372 ft. over all, and 37 ft. molded depth, has been let to the Wheeler Co., at West Bay City, Mich. The vessel is expected to cost nearly $230,000, and will probably be the largest vessel in the lakes trades, until the talked of ships of the Minnesota Steamship Co. are built. It will carry nearly 6,000 tons on the deep draft soon to be ready on the lakes.

The steel ship, S. S. Curry, has taken on a load of 246,000 bushels of oats at Chicago. This is the largest cargo of grain ever loaded on the lakes.

Four rock stamping mills, for work in the new gold district of the Seine River, north of Lake Superior, are being hauled overland 125 miles from Iowa, the northern terminus of the Duluth & Iron Range road. Much interest is manifested in the region.

Railroad Material for Export.

The whaleback steamer, Joseph L. Colby, sailed from Baltimore for Tampico, Mexico, last week, loaded with 40 freight cars and trucks, and 700 tons of rails. The material is for the Mexican Terminal & Railroad Company, of Monterey.

The schooner, F. B. Balano, has been chartered in New York to take a cargo of rails, freight cars, and 250 tons of coal from Baltimore to Nombre-de-Dios, United States of Columbia. The material is to be used in a South American mine.

Snow Blockades in California.

Press despatches of Jan. 22 report the worst snow blockade ever known on the Shasta division of the Southern Pacific. Near Dunsmuir, Cal., an avalanche fell from a high mountain and covered the track from 20 to 60 feet deep for a length of a quarter of a mile. The blockade occurred in a narrow valley, and dammed the Sacramento River. The avalanche tore up and carried down trees, so that the clearing of the blockade was very difficult. Heavy snows have also delayed trains on the Central Pacific. At Truckee, Dutch Flat, Reno, and other places in that vicinity, the snow was 10 and 20 feet deep. At many places along the track it is said to have been so high that the rotary snow plows could not be made to throw snow over the banks. The same week there were great snowslides in Colorado. A serious blockade occurred near Crested Butte.

The Brooklyn Street Car Strike.

The situation in Brooklyn has quieted down, and business has been almost completely resumed, though lawlessness continues. The militia had difficulty in repressing the interference with the operation of the cars, and two or more men were shot. On January 24 Judge Gaynor issued a mandamus ordering the Brooklyn Heights Company to operate its lines without fail, or forfeit its charter. This encouraged the strikers, and, pending the formal issuance of the mandamus, they relaxed their efforts to make trouble, but the writ finally came out in alternative form, allowing the company 20 days to comply, and violence was resumed. After the stone-throwing and intimidation of new men had been mostly repressed, the strikers kept up their warfare by cutting wires in the dark. The linemen of the companies struck, but sufficient new men seem to have been procured to keep the cars running. Saturday was comparatively quiet, and on Monday some of the militia were relieved, but after this reduction of force the stone-throwing was renewed. On Tuesday the newspapers reported that about four-fifths of the normal number of cars was running.

A Pass Fraud.

Wm. A. Burns, alias H. C. Wilson, was arrested in Chicago last week, and in his possession was found a complete outfit of printed letter heads imitating those of a number of railroads, rubber stamps for counter-signature, etc. His method of operation was to forge a request for a pass on one of the bogus letter heads, and O. K. it with one of the many stamps in his possession, forging the name of the official who was supposed to O. K. it. He would then make the request from some hotel, or in person, for the transportation, which he generally succeeded in obtaining. His arrest was the direct result of information furnished by the General Superintendent of the Rio Grande Western, Mr. A. E. Welby, whose name he had been making rather free use of lately. He also had a fine supply of forged traveling cards of the various employes' unions, which he made use of as an adjunct to his other business.

LOCOMOTIVE BUILDING.

The Boston & Albany has ordered 20 freight locomotives from the Schenectady Locomotive Works. This is in addition to the order recently given to the same company.

The Lehigh Valley has ordered 25 ten wheel freight locomotives and five passenger locomotives from the Baldwin Locomotive Works.

The Lehigh Valley is building two passenger engines at its shops at South Easton, Pa., similar to the passenger engine built last July at these shops.

A passenger locomotive is being built at the Lincoln Park shops of the Buffalo, Rochester & Pittsburg Railroad near Rochester, N. Y., by Mr. Turner, Superintendent of Motive Power of the railroad. The engine has 18 in. x 24 in. cylinders, with 68 in. wheels. It has an electric headlight, and aluminum outside finishings have been used.

Two heavy locomotives have been built at the Schenectady Locomotive Works for the Central Pacific Railroad, a part of an order for 20 given last year. The engines are to be used on the mountain divisions. They have four pairs of drivers and two pairs of truck wheels. One of these engines weighs 173,000 lbs. The tender weighs, heavy, 93,800 lbs.. The boiler is 72 in. in diameter. The cylinders are 22 in. x 26 in.

CAR BUILDING.

The Delaware & Hudson Canal Co. is building two first-class passenger cars at its Carbondale shops.

The Philadelphia, Reading & New England has let 150 coal cars to the Union Car Co., of Depew, N. Y.

The 350 ventilated fruit cars for which the Southern Railway has been asking bids have been let to the Ohio Falls Car Co.

The Minneapolis & St. Louis will probably soon ask bids for building five day coaches and 200 box cars for that road.

The St. Louis, Alton & Terre Haute is to order 100 box cars shortly.

The Barney & Smith Car Co., of Dayton, O., has recently completed and delivered to the Queen & Crescent lines eight handsomely built cars, one a dining car, for the through train service of that company.

The award for the 2,000 freight cars for the Missouri, Kansas & Texas will be made about Feb. 15. This order includes 800 box cars, 500 coal cars and 700 furniture cars as mentioned in the *Railroad Gazette* three or four weeks ago.

The Memphis Car & Foundry Co., of Memphis, Tenn., has closed contracts with the Illinois Central, Louisville & Nashville, Tennessee Midland, and Kansas City, Memphis & Birmingham Railroads, for a portion of car wheels and castings required by those roads during the year. The company is also rebuilding a large number of freight cars for the Kansas City, Memphis & Birmingham, and the Kansas City, Fort Scott & Memphis, and is constructing new cars for tank line companies.

BRIDGE BUILDING.

Breckenridge, Col.—A bill providing for a bridge across the Blue River at Breckenridge has been introduced in the Colorado Legislature, now in session.

Buffalo, N. Y.—A bill to appropriate $9,000 for an iron bridge, to replace the present wooden structure over the Erie Canal at Mill street, in Buffalo, has been introduced in the New York Legislature.

A bill providing for a new bridge over the Erie Canal at Porter avenue in Buffalo, appropriating $47,500 as the State's share of the cost, the balance to be paid by the city, is also before the Legislature. The bridge is to be built upon plans to be approved by the Board of Park Commissioners.

Fairport, N. Y.—A bill has been introduced into the Assembly by Mr. Parsons, appropriating $6,500 for a new double roadway iron canal bridge at Main street, Fairport.

Lamar, Col.—A bill to appropriate $15,000 to contstruct a bridge across the Arkansas River near Lamar, is now before the Colorado Legislature.

Little Falls, N. Y.—A bridge bill, appropriating $25,000 for new bridges on German street and Bellinger

street, has been introduced by Assemblyman Smith in the New York State Legislature.

Milwaukee, Wis.—The Chicago, Milwaukee & St. Paul is asking for tenders for a lot of plate girder spans 20 to 100 ft. long.

New Westminster, B. C.—The municipal bridge near Westminster Junction, which cost $6,000, and which was swept away by recent flood, will be rebuilt immediately.

Ottawa, Ont.—The City Council has decided to rebuild the Hurdman's bridge, the work to cost not more than $10,000.

Palatka, Fla.—The contract for building the new steel draw span and approach for the bridge over the St. John's River at Palatka, Fla., for the Jacksonville, St. Augustine & Indian River Railroad, has been awarded to the Pittsburg Bridge Co.

Powers County, Col.—An appropriation of $8,000 to construct a bridge across the Arkansas River in Powers County, is authorized by a bill now pending in the State Legislature.

Pueblo, Col.—The Pittsburgh Bridge Co. has a contract for two spans, 150 ft. c. to c. end pins for the Union Pacific, Denver & Gulf Railroad, over Fountain Creek at Pueblo.

San Francisco.—Mr. H. C. Holmes, Chief Engineer of the Harbor States Harbor Commissioners, having in charge the improvements at San Francisco harbor, has recently completed plans for a new bridge over Market street to the ferry house and station, being built by the Harbor Commissioners. The bridge is to cross Market street, with two spans of 160 ft. each, and one span of 53 ft. A roadway of 23 ft. in width is provided in the plans. The cost of the structure is estimated at over $15,000. Several plans for this bridge have been submitted to the Commissioners, but that of Engineer Holmes seems to be viewed most favorably It is intended to have the bridge completed by the time the new station is ready to be opened.

Toledo, O.—The Toledo & Maumee Electric Railway Co., has awarded the contract for an iron bridge across the Maumee River to the Massillon Bridge Co., for $15,000. The bridge will be located 100 yards north of the present structure which spans the river between Maumee and Perrysburg.

Warren, Pa.—Last week the Town Council decided to allow the freeholders of Warren to vote at the regular February election upon increasing the borough debt $7,000, for the purpose of securing a free bridge over the Allegheny River.

Weldon, N. C.—The Atlantic Coast Line is having a survey made between Weldon, N. C., and Garysburg, N. C., and will soon build an iron and steel bridge across the Roanoke River. At present the Atlantic Coast Line is using the bridge of the Seaboard Air Line.

MEETINGS AND ANNOUNCEMENTS.

Dividends.

Dividends on the capital stocks of railroad companies have been declared as follows:

Chicago, St. Paul, Minneapolis & Omaha, 3½ per cent. on the preferred stock, payable Feb. 20.

Rome, Watertown & Ogdensburg, 1¼ per cent., payable Feb. 15.

Stockholders' Meetings.

Meetings of the stockholders of railroad companies will be held as follows:

Barclay, annual, Philadelphia, Pa., Feb. 11.
Cincinnati, Jackson & Mackinaw, annual Toledo, O., Feb. 6.
Cumberland Railway & Coal Co., annual, Montreal, Feb. 13.
Eastern Kentucky, annual, Riverton, Ky., Feb. 6.
Keokuk & Western, annual, Keokuk, Ia., Feb. 6.
Kingston & Pembroke, annual, Kingston, Feb. 13.
Missouri, Kansas & Texas, special, Parsons, Kansas, Feb. 14, to ratify the lease of the Southwestern Mineral.
Missouri Pacific, annual, St. Louis, Mo., March 12.
Montreal & Atlantic, special, Montreal, Feb. 11.
Peoria & Eastern, annual, Danville, Ill., Feb. 13.
Philadelphia & Erie, annual, Philadelphia, Pa., Feb. 11.
St. Louis, Iron Mountain & Southern, annual, St. Louis, Mo., Mar. 12.
Saskatchewan & Western, annual, Winnipeg, Feb. 7.
Summit Branch, annual, Philadelphia, Pa., Feb. 12.
Wheeling & Lake Erie, annual, Toledo, O., Feb. 12.

Technical Meetings.

Meetings and conventions of railroad associations and technical societies will be held as follows:

The *Freight Claim Association* will hold its annual meeting in Chicago on March 13. The headquarters will be at the Auditorium. The Secretary is S. A. Mehorter of Philadelphia.

The *New York Railroad Club* meets at the rooms of the American Society of Mechanical Engineers, 12 West Thirty-first street, New York City, on the third Thursday in each month, at 8 p. m.

The *New England Railroad Club* meets at Wesleyan Hall, Bromfield street, Boston, Mass., on the second Wednesday of each month.

The *Central Railway Club* meets at the Hotel Iroquois, Buffalo, N. Y., on the fourth Wednesday of January, March, April, September and October, at 10 a. m.

The *Southern and Southwestern Railway Club* meets at the Kimball House, Atlanta, Ga., on the third Thursday in January, April, August and November.

The *Northwestern Railroad Club* meets at the Ryan Hotel, St. Paul, on the second Tuesday of each month, at 8 p. m.

The *Northwestern Track and Bridge Association* meets at the St. Paul Union Station, on the Friday following the second Wednesday of March, June, September and December, at 2.30 p. m.

The *American Society of Civil Engineers* meets at the House of the Society, 127 East Twenty-third street, New York, on the first and third Wednesdays in each month, at 8 p. m

The *Western Society of Engineers* meets on the first Wednesday in each month, at 8 p. m. The headquarters of the society are at 51 Lakeside Building, Chicago.

The *Engineers' Club of Philadelphia* meets at the House of the Club, 1122 Girard street, Philadelphia, on the first and third Saturdays of each month, at 8 p. m.

The *Engineers' and Architects' Club of Louisville* meets in the Norton Building, Fourth avenue and Jefferson street, on the second Thursday in each month, at 8 p. m.

The *Association of Engineers of Virginia* holds informal meetings on the third Wednesday of each month, from September to May, inclusive, at 710 Terry Building, Roanoke, at 8 p. m.

The *Boston Society of Civil Engineers* meets at Wesleyan Hall, 36 Bromfield street, Boston, on the third Wednesday in each month, at 7.30 p. m.

The *Engineers' Club of St. Louis* meets in the Missouri Historical Society Building, corner Sixteenth street and Lucas place, St Louis, on the first and third Wednesdays in each month.

Engineers' Society of Western Pennsylvania.

The Engineers' Society of Western Pennsylvania held its annual meeting on Jan. 17, in the Carnegie Library Building, Allegheny, President Davis in the chair. The Treasurer, Secretary, Board of Direction, Library Committee, and others, presented reports, and the usual routine business of a yearly meeting was transacted. The retiring President then read his address, which, while touching upon questions of general interest, treated mianly of the work of engineers in and about Pittsburg, and indicated lines of action which should be followed to insure more rapid growth and development in Western Pennsylvania. The election of officers for the ensuing year resulted as follows: For President, T. H. Johnson; Vice-Presidents, W. G. Wilkins and Emil Swensson; Secretary, Daniel Carhart, and Treasurer, A. E. Frost.

The monthly meeting was then held, committees reported, and several persons were elected to membership, and though it was understood that further discussion of the paper read at the last meeting by Mr. Bole, on "Losses in the Steam Engine," would be discussed, the hour being late it was voted to adjourn.

Engineering Association of the South.

A regular monthly meeting of the association was held Jan. 10, President Dudley presiding. The question of joining the Association of Engineering Societies was discussed, and on motion it was decided not to join this year. The subject reported for topical discussion at the next meeting was, "The Preservation of Iron Surfaces." Mr. A. B. Wood then read a paper on "The International Boundary Survey between Mexico and the United States," giving a sketch of the entire work as viewed from the American camp, and graphically describing the methods, difficulties and dangers in the prosecution of the survey. Although the object of the work was merely to retrace the old line of 1853, extreme accuracy was necessary, in order that in the future, the establishment of any lost monument will be an easy matter.

Western Society of Engineers.

The next meeting of the society will be held in Science Hall, Armour Institute, Thirty-third street and Armour avenue, Chicago, on Wednesday, February 6, 1895, at 8 o'clock, p. m.

Two papers—Description of the Work and Methods of construction on the Brighton and Summit Divisions, respectively, of the Chicago Sanitary Drainage Canal—will be presented by Mr. Alex. E. Kastl, and Mr. E. R. Shanable, Division Engineers. These papers will be illustrated by more than fifty lantern views. The entire institute will be open for inspection, and members are cordially invited to bring their friends with them, and spend an hour before the meeting, in visiting the various laboratories and shops, the library, museum and gymnasium.

The Engineers' Club of Philadelphia.

At the meeting on Jan. 5, President John C. Trautwine, Jr., in the chair, 67 members and visitors were present. The following were elected to active membership: Messrs. Victor Angerer, John A. Carlisle, Ernest Hayward Fairbanks, George B. Hartley, Harrison W. Latta, Norman Leslie Stamm, Alfred G. Stokes, George B. Taylor and Edward R. Zoll.

Mr. A Falkenau announced that Mr. Wilfred Lewis had asked him to bring before the Club for consideration the question of the proper form of rail to be used on street railroads. His communication on this subject was laid on the table to be brought up at a future meeting.

THE UNITED STATES GEOLOGICAL SURVEY.

Mr. Charles D. Walcott, Director of the United States Geological Survey, presented a communication upon this subject, in which he explained in detail the scope of the work of his department, methods of obtaining topographic and hydrographic details and mapping from them, the geological work in its two-fold classification of special investigations and aerial mapping, the economic value of the work in showing the resourses of the country, and the rapidity with which the work can be done, as evidenced by the progress made during the past year.

The Department is also commencing the work of obtaining information with regard to the choice and manipulation of materials for highways, although as yet obliged to use temporary laboratories for that purpose.

Mr. Walcott's remarks were illustrated by lantern reproductions of topographic and geologic maps, photographic views of instruments and equipments used in the work and of places in the west showing peculiar characteristics. The paper will be published in full in the Club's Proceedings.

Engineers' and Architects' Club of Louisville.

The annual meeting of the Engineers' and Architects' Club of Louisville was held on Jan. 10.

The following officers for the year 1895 were elected:
President, R. Monfort; *Vice-President*, Max Drach, and *Secretary*, Jas. K. Zollinger.

Regular meetings will be held on the second Thursday of each month, as heretofore.

Engineering Society of Western New York.

This association has recently been organized in Buffalo, N. Y., by a large number of prominent engineers of Buffalo and its vicinity, members of the present national engineering societies. The first officers of the new society are: President, George E. Mann; Vice-Presidents, E. B. Guthrie and Walter McColloh; Secretary and Treasurer, George R. Sikes; Directors, George B. Burbank, C. M. Morse.

The present membership of the new society is about 35, and charter members are all restricted to members of the American Society of Civil Engineers, the American Society of Mechanical Engineers, the American Institute of Electrical Engineers, and the American Institute of Architects. The membership will include three classes—members, who must be engineers or architects actively engaged as such for three years; associates, qualified by business relations and practical experience to co-operate with engineers in the advancement of professional knowledge, and honorary members. There will be a regular meetings for the discussion of papers, probably on the first Monday in each month, and the formation of an engineering library will be one of the chief aims of the society.

American Association for the Advancement of Science.

The council of this association, at a meeting held on Saturday of last week, decided to hold the next meeting at Springfield, Mass., the first general session beginning on Aug. 29.

PERSONAL.

—Col. Horace Scott, formerly General Superintendent of the Jeffersonville, Madison & Indianapolis Railroad, died in Louisville on Thursday of last week.

—Mr. E. A. Nixon, Traffic Manager of the Memphis Car & Foundry Co., has been elected Vice-President of the company, and will hereafter fill both positions.

—Mr. George E. Sturtevant has been appointed Assistant General Passenger Agent of the Boston & Maine Railroad. He succeeds Mr. F. N. Chase, who resigned some time ago.

—Mr. F. P. Fogg, who was elected last fall General Manager of the Wiscasset & Quebec Railroad, under construction through Maine, resigned that office at the recent annual meeting.

—Mr. Clemens Herschel, M. Am. Soc. C. E., delivered a lecture, January 25, on "The Measurement of Water," before the students of the Rensselaer Polytechnic Institute, at Troy, N. Y.

—Mr. H. M. Perry, who has been foreman of the Cincinnati Southern car department at Ludlow, Ky., has resigned to accept the position of Manager of the Madison Car Works, at Madison, Ill.

—Mr. John Scott, for 18 years General Solicitor of the Pennsylvania Railroad Company, has resigned, his resignation taking effect Feb. 1. The Directors have appointed ex-Judge James A. Logan as his successor.

—John F. Flournoy has been appointed permanent Receiver of the Georgia Midland & Gulf Railroad, about 100 miles long. He was appointed temporary Receiver in November last, in a suit filed by the Central Trust Co.

—M S. Z. Earle, of Marshfield, Ore., has resigned as Chief Engineer of the Coos Bay, Roseburg & Eastern Railroad, in Oregon, which has about 30 miles of road in operation, and is extending its line from the Pacific Coast.

—Mr. William H. Brewster is now selling agent for the Heath Rail Joint Co., with office in the Monadnock Building, Chicago. He was recently with the Truss Rail Joint Co., and is one of the oldest of the supplymen in the West.

—Mr. William F. Herman, who has been General Agent in Cleveland, for the past few years, of the Cleveland & Buffalo Transit Company, has been made General Passenger Agent of that line. He was formerly agent of the Great Northern in Buffalo.

—Mr. M. M. Richey, Superintendent of the Calumet & Blue Island, has had his title changed to General Superintendent. His authority has been extended to embrace the Joliet & Blue Island, the Chicago & Southeastern, and the Chicago & Kenosha.

—Mr. Franklin Darracott, for 13 years Vice-President of the Mason Manufacturing Co., of New York, died in New York on January 24. He was born in Boston in 1821, and when a young man was employed on the survey for the Boston & Albany Railroad. He was a well-known civil engineer in Boston for years.

—Judge Reagan has accepted a re-appointment as Railroad Commissioner of Texas, for a second term. Judge Reagan has been in very poor health for a long time, and had announced his intention to retire from public life, but he was led to reconsider that determination and accept the reappointment.

—Dr. W. H. Smith has been appointed occulist for the Western Divison of the Canadian Pacific. In the past master mechanics and assistant superintendents have examined conductors, engineers, firemen and brakemen as to their sight, but now, it is said, the company has decided to have all train men tested by an expert.

—Mr. R. H. Hill was last week appointed Auditor of the Lake Shore & Michigan Southern Railroad, to succeed the late C. P. Leland. Mr. Hill has been Acting Auditor of the Lake Shore road since Mr. Leland's death. He was formerly Auditor of Freight Accounts, and has been with the Lake Shore in its Accounting Department for very many years.

—Mr. J. J. Farnsworth, who recently went from the Southern Railway to the Savannah, Florida & Western, as District Passenger Agent at Savannah, Ga., has been promoted to be Eastern Passenger Agent of the lines included in the Plant system, with headquarters at 261 Broadway, New York City, the appointment going into effect on February 1.

—Mr. W. E. Stearns has been appointed Traveling Agent for the Bridge and Construction Department of the Pennsylvania Steel Co., of Steelton, Pa., also for the Construction and Mechanical Department of the Maryland Steel Co., with headquarters in Baltimore, Md. Mr. Stearns has been with the Berlin Bridge Co. for some time, and was recently Purchasing Agent at Philadelphia.

—Mr. James E. Grannis, President of the Georgia Midland & Gulf Railroad since 1888, died suddenly in New York City last week. He was President of the Tradesmen's National Bank in New York, of which he had been a Director for many years. He was elected Vice-president in 1888, about the same time he became President of the Georgia Midland & Gulf Railroad, which is now controlled by a receiver.

—Mr. W. B. Ryan, late General Agent of the Ward Steamship line for Mexico, has been appointed General Eastern Joint Agent of the Mexican International, the Inter-Oceanic, of Mexico, the Mexican National, and the Mexican Central, with headquarters in New York City. He succeeds E. W. How, G. F. Wilcoxson, of the Mexican National, and J. J. Allen, of the Mexican Central, who have been the general agents in the United States of the respective roads. Some years ago Mr. Ryan was commercial agent of the Mexican National at Laredo, Tex.

—Mr. William Thornburgh, of Cleveland, O., has recently been appointed Superintendent of the Columbus, Shawnee & Hocking, in the place of Mr. H. O. Pond, resigned. Mr. Thornburgh has recently been Manager of a large coal company at Cleveland, O., but previous to 1892 was for many years in the railroad business, chiefly in Ohio. He was Superintendent of the Cleveland, Lorain & Wheeling road, and afterwards General Manager of the Valley Railroad of Ohio, and was President of the Akron & Chicago Junction Railroad during its construction, until it was turned over to the Baltimore & Ohio, the lessee. He then became President of the Cleveland, Wooster & Muskingum Valley road, then being constructed through Ohio as a branch of the Baltimore & Ohio.

—Sir Joseph W. Pease has been elected Chairman of the North Eastern Railroad of England. He has been Deputy Chairman for the last five years, and is the oldest director of the company in length of service, having held that office since 1863, when the Stockton & Darlington road was consolidated with the North Eastern. Sir Joseph's election to the position of Chairman of the North

Eastern seems to be peculiarly fitting. He is not only well qualified for the position by natural qualifications, and his previous service with the company, but also by tradition. His father was the first Treasurer of the Stockton & Darlington Railroad, and prominently concerned in the railroad history of the north of England, and his grandfather, Mr. Edward Pease, was one of the chief promoters of the Stockton & Darlington Railroad, and secured the appointment of Mr. George Stephenson as the engineer of that railroad. He is referred to in the English papers as the father of railways in England.

ELECTIONS AND APPOINTMENTS.

Baltimore & Potomac.—Benjamin F. Newcomer, of Baltimore, was elected President of the railroad, on Jan. 25, succeeding the late ex-Governor Oden Bowie. Messrs. John B. Ramsay and Michael Jenkins, of Baltimore, were elected Directors to fill vacancies.

Central Pennsylvania & Western.—At Williamsport, Pa., last week, officers were elected as follows: President, R. T. McCabe, New York; Directors: E. R. Payne, Williamsport; James Kerr, Clearfield; Wilberforce Sully, New York; Morris Liveright, Steven Peabody, N. M. Betts, Towanda, Pa.

Chicago & South Side Rapid Transit.—The following were elected directors: at the recent annual meeting: George T. Smith, David R. Lewis and William R. Champlin; the board now consisting of George T. Smith, David R. Lewis, William R. Champlin, Marcellus Hopkins and William W. Gurley.

Kansas City, Pittsburg & Gulf Railroad.—The company held its annual meeting last week. The old board of directors was re-elected with the exception of C. A. Bradley, who was replaced by E. P. Merwin, of New York. T. J. Elitsingh of Amsterdam, Holland, was elected Second Vice-President in place of Richard Gentry of Topeka. The other officers elected are E. L. Martin, President; A. E. Stilwell and A A. Mosher, Vice-Presidents W. S. Taylor, Secretary and Treasurer; A. L. Howe, Assistant Secretary and Assistant Treasurer; W. K. Morley, general Superintendent; James Donohue General Freight and Passenger Agent; and G. N. Wilson, Auditor.

Lake Shore & Michigan Southern.—R. H. Hill has been appointed Auditor of this company, taking effect from Jan. 1. M. C. Tully has been appointed Auditor of Freight Receipts.

Mt. Jewett & Smethport.—At the recent annual meeting of this company B. F. Hazleton was elected President, and E. F. Clark, Vice-President and General Manager. The general offices are at Bradford, Pa.,

Trinity, Cameron & Western.—The annual meeting of the stockholders of the railroad was held at Cameron, Tex., Jan. 18. The following directors were elected: Emzy Taylor, O. T. Cooper, Lee M. Taylor, Ed. Taylor, R. H. Snyder, J. S Snyder, R. Lyles, F. M. Crawford and W. J. Jones. The directors elected Emzy Taylor, President; D. H. Snyder, Vice-President; E. Taylor, Secretary; O. T. Cooper, Treasurer; R. Lyles, General Manager. This is the same directory as recently elected for the Georgetown & Granger Railroad, with which road it is proposed to consolidate.

Velasco Terminal.—The following officers of this company have been recently elected: H. G. Curtis, Vice-President; E. D. Dorchester, Secretary; J. M. Moore, Treasurer; all with headquarters at Velasco, Tex.

Williamsport & North Branch.—Henry C. McCormick of Pennsylvania, by reason of his appointment as Attorney General of Pennsylvania, has resigned as President of this company. No one has as yet been elected to succeed him. Vice-President George N. Forman, of Buffalo, N. Y., will, for the present, act as President.

RAILROAD CONSTRUCTION,
Incorporations, Surveys, Etc.

Baltimore Belt.—One track in the tunnel under Howard street, Baltimore, has been completed, and a force is at work on a second track. The first train through the tunnel and over the whole of the new belt line will be run this week. The train will be run to test the tracks and to give the officers of the B. & O., the contractors, and the engineers who have constructed the road, an opportunity of practically testing the whole work. The whole road will be ready for operation of B. & O. through trains by April 1. Then the electric motors, now being built by the General Electric Co., will be completed and ready for the work in the tunnel. The B. & O. Company will begin the erection of the stations for the belt line as soon as the weather permits in the spring. The two most important of these will be at the corner of Howard and Lombard streets and on the Bolton lot. Plans for the stations have already been prepared by Baldwin & Pennington, architects.

Brunswick & Pensacola.—This railroad is being built by certain stockholders of the Suwanee Canal Co., of Florida. The work is not being done by the Suwanee Canal Co., as has been stated in local papers. That company is engaged in no railroad building. The railroad will connect with the works of the Suwanee Canal Co on the eastern margin of the Okefenokee swamp, at a place called Camp Cornelia, and running thence to Folkston, a station on the Savannah, Florida & Western Railroad, 42 miles north of Jacksonville. The contractors for grading and track laying are Davis & Root, Folkston, Ga. All the grading is completed, and about six miles of track laid Most of this track has been laid since January 1. About 1,800 ft. of trestling has been built over Spanish Creek and Stanley Branch. The money for the work was advanced by the stockholders associated in building the road. It will be completed within a week or two. This road has been constructed primarily for the purpose of transporting lumber from the eastern part of the swamp to the railroads, and to the St. Mary's and Satilla Rivers, in order to reach ocean transportation. The road is not simply a log and lumber road, but is well built, and will doubtless constitute a link in a line of transportation that will connect the Atlantic and the Gulf. At present, however, it will be used only for the purposes of the Suwanee Canal Co. in getting out its product of logs and timber. Henry Jackson, of Atlanta, is President, and G. S. Burtchaell is Chief Engineer.

Cheat River.—At the annual meeting at Pittsburg, W. S. Guffy was elected President; George Herd, Treasurer; W. F. Johnson, Secretary. The Chief Engineer of the road reported that a survey for a branch had been made between Rowellsburg and Point Marion, Pa., on the upper Monongahela River, but it was stated that it may be several months before work is begun on this branch, which is to open up coal territory.

Chicago, Indiana & Eastern.—The grading from Fairmont, to Matthews, Ind., a ten mile section, is now completed, and the culvert and bridging are being put in; the ties and rails (72 lbs.) are contracted for. This road opens up a new gas field, connecting at Fairmount with the Big Four. H. E. Drew, of Indianapolis, is contractor. Col. M. N. Alberger, late Engineer and General Manager of the Lake Street Elevated Railroad, of Chicago, has formed a syndicate to furnish the capital. All material will be purchased for cash. The Chicago office of the company is in the New York Life Building.

Chicago, Kansas & Arkansas.—This company has filed articles of incorporation in Kansas. The charter provides for the construction of a railroad 216 miles in length from a point opposite St. Joseph, Mo., to Little Rock Ark. The directors named in the charter are as follows: Charles N. Hale, Richard E. Breed and Joseph Foster of Chicago; Thomas J. Porter, F. Farney and Ned L. Biles of St. Joseph, Mo.; George Brenner, N. G. Brewer and F. H. Denny of Doniphan, Kan.

Cleveland, Lorain & Wheeling.—The short extension of this road to the Massillon coal fields, near Cleveland, mentioned recently, will be about four miles long. It is an extension of the present line reaching the coal mines of the Massillon & Cleveland Coal Company, which is now something over a mile long. The location has been made, right of way all secured, and the estimates of construction work are now being made, but the contracts will not be given out immediately. W. B. Hanlon, of Cleveland, O., is the Chief Engineer.

Coleman & Vining.—The railroad from near Coleman, Tex., to the Vining coal mines, mentioned in these columns two weeks ago, has been organized under this title, with Wm. L. Vining as President, E. A. Coleman, Secretary, and John W. Maxey Austin, Chief Engineer. The route surveyed is from a point on the Gulf, Colorado & Santa Fe, about seven miles from Coleman City, known as Overalls Junction, thence in a southerly direction to the town of Vining on the Colorado River, which is the present terminus. The distance is about 23 miles. Final surveys are completed, and the prospects of building are considered good. As soon as the right of way deeds can be had, and which will be within the next 60 days, the contracts will be let.

Colorado Midland.—It is now proposed to secure a separation of this company from the Santa Fe system by the bondholders, who believe, with the revival of the mining industry in Leadville, due to the recent gold discoveries, that the property can now be operated at a handsome profit. Extensions into northwestern Colorado are also being considered.

Columbia River & Red Mountain.—Articles of incorporation were filed at Spokane, Wash., last week for this company. The incorporators are D. C. Corbin of New York, Austin Corbin, Jr., Frank George and Albert Allen of Spokane. This is the proposed extension of the Spokane & Northern to the Trail Creek mines of British Columbia. Mr. Corbin is now applying for a charter before the Victoria Legislature.

Coudersport & Port Allegheny.—The stockholders have considered the proposed extension to Ulysses Pa., and approved the project. The road will be built the coming year.

Galveston, La Porte & Northern.—The consolidation of the La Porte, Houston & Northern, the North Galveston, Houston & Kansas City, and the Houston-Belt Magnolia Park Railroads has been concluded, and the contract let for the completion of the through line, which will be operated under the name of the Galveston, La Porte & Houston Railroad. Mr. L. J. Smith, a well-known contractor of Kansas City, Mo., has secured the contract, and will begin active work at once. The road from Houston to Virginia-Point opposite Galveston, to be completed within 90 days. The contract includes a new bridge across Galveston Bay, and terminal facilities in the city of Galveston, to be completed by July 1, 1895. This new combination forms a third line between Houston and Galveston, which is now a deep-water port; and will furnish terminal facilities both at Galveston and La Porte for the lines that seek a tide-water outlet.

International & Oak Orchard.—This company has been incorporated to construct a road about ten miles long, to be operated by steam or electricity, from Albion, N. Y., to the west side of Oak Orchard Creek and to the shores of Lake Ontario. The capital is $175,000.

Lake Superior Lumbering Co.—The logging railroad of this company, a branch of the Weyerhauser syndicate, is to extend to the head of Lake Superior. The road is now 20 miles long, and reaches the country between the lines of the Northern Pacific and Duluth, South Shore & Atlantic. It will build some 15 miles at once, standard gage.

Long Island.—Brendlinger & Nearing, of Yonkers, N. Y., have recently been awarded the contract for building the extension of this road beyond Bridgehampton, on the south coast of Long Island. The work is being done under the charter of the Montauk Extension Railroad Company. The line will be eight miles long, extending from Bridgehampton to Easthampton and Amagansett. The work has just begun. The maximum grade on the line will be less than 1 per cent., and the curves are only two degrees. There are 11 iron bridges to be built. P. D. Ford is Chief Engineer of the railroad at Long Island City, N. Y.

Long Island City, N. Y.—The Long Island Railroad will build 11 iron bridges on an extension beyond Bridgehampton now under way. The spans will vary from 20 ft. to 40 ft. in length.

Louisville Southern.—Engineers of the Jeffersonville & Louisville Bridge Co. have just completed a survey for a cut-off from Stine Station, Ky., to the terminus of the new bridge. The route permitted under the bridge charter will save eight miles for the Louisville Southern into Louisville, avoiding a circuit of the city, and is done in the interest of the Chesapeake & Ohio, which proposes to use the Louisville Southern tracks from Lexington. Two tunnels may be necessary and right of way will be expensive. The Louisville & Nashville will likely oppose the construction of the cut-off.

New Roads.—D. W. Hines, the chief projector of the road from Grand Rapids, N. D., northwest, is at work with a large crew of men getting out the ties along the route of the road at the rate of from 4,000 to 5,000, at a cost, besides the labor, of only 2½ cents each. One branch of the road will cross the river at Drayton, N. D., and proceed west through St. Thomas and Cavilier to the Turtle Mountains at Portal, where it will connect with the "Soo." The right of way is secured for the entire distance, and some of the grading done.

The Welch Brothers, lumbermen, at Hulings, W. Va., will build a railroad seven miles in length from their lumber mills in that town to the mouth of Glady's Creek and up that stream to a large tract of timber which they own and wish to bring within reach of their mills. Work will begin soon.

Pittsburg, Chautauqua & Lake Erie.—The proposed road from Warren, Pa., to Lake Erie, noted briefly last week, is to be organized under this name. It is to be built from Warren, Pa., to Westfield and Barcelona, N. Y., on the shores of Lake Erie, one of the best harbors on Lake Erie. The road will be about 50 miles in length and will extend through Chandlers Valley, Sugar Grove, North Warren, and Lottsville, Pa., and Grant, Panama, Stedman, Chautauqua, Mayville, and Westfield, N. Y. The President of the road is T. T. Keckeler, Philadelphia, and D. F. A. Wheelock, Warren, Pa., is Chief Engineer. The survey has been made, and the grades and curves will be easy, and cost of construction light. The road will be through a rich agricultural and manufacturing locality, and if built will make the shortest line for travel from the east and south to Chautauqua and to the lakes, and a short line for coal to the lakes. The President is negotiating with parties for building the line this season, but as yet is not ready to state a time for letting the contract.

Roaring Creek & Charleston.—A heavy flood last week, washed away one pier of the Monroe bridge on this line in West Virginia, and damaged another. The line is not in operation, and the Receiver has taken no action looking to repairing the roadbed. It is not likely that anything will be done either toward putting the road in order for operating until the question of whether it is to be operated under the control of the West Virginia State Courts or the United States Court is decided.

San Francisco & San Joaquin Valley.—The committee of local capitalists, having in charge the project of constructing the new railroad through the San Joaquin Valley, in California, has subscribed $1,025,000. Claus Spreckles, the chairman, contributed $500,000. The committee has decided to incorporate the company with a capital stock of $6,000,000, and the work of construction will commence when $2,000,000 is subscribed.

Santa Fe, Prescott & Phoenix.—Heavy floods in Arizona have damaged the roadbed, and traffic has been temporarily suspended. There have been several land slides, and some small bridges have gone out, and some of the false work of the Hassayampa bridge has been swept away.

Southern.—The track of the East Tennessee, Virginia & Georgia division has been laid with 75 lb. rails from Chattanooga to Ooltewah, a distance of 17 miles, in place of 56-lb. rails. One thousand tons of rails of the same weight have been delivered at Corinth, Miss., to be put down on the Memphis & Charleston division of the same line.

Unadilla Valley.—This road is already completed and in operation from Bridgewater south to South Edmeston, N. Y., 15 miles. Construction work on the remaining 4½ miles to the terminus at New Berlin, a station on the New York, Ontario & Western, is now going on. Two miles of this is graded and ready for track laying. The grades on this portion are light, not exceeding ½ per cent. The curves do not exceed three degrees. There are no heavy cuts. It is expected that the whole line from Bridgewater to New Berlin, 19½ miles, will be in operation by May 1. The road follows the west bank of the Unadilla River to New Berlin. F. F. Culver, 80 Broadway, New York City, is General Manager. The contractor for the work is George L. Rusling, of 137 Broadway, New York City.

Union Pacific, Denver & Gulf.—Grading work upon the proposed line from Trinidad, Col., north to Pueblo, has been stopped, pending a revised agreement between the Denver & Rio Grande, and the company for the use of the track of the former.

West Virginia Central & Pittsburg.—Ex-Senator Henry G. Davis, President of this company, speaking of the surveys recently made from Elkins, W. Va., to the South, mention of which has been made frequently in these columns, said last week: "The survey has been successful and satisfactory. An easy and direct route has been located from Elkins, in a generally southerly direction to Huntersville, the county seat of Pocahontas County. The distance is about 100 miles. Huntersville is the terminal point contemplated in the surveys made northward from the main line of the Chesapeake & Ohio Railroad. The length of the Chesapeake & Ohio extension to Huntersville is 60 miles. As to the date when work on this extension will likely begin, it is too soon to speak. It is safe to say no work will be done in this direction till the Baltimore & Cumberland road is completed from Cumberland to Hagerstown, Md. It will take at least a year to build this road after the work has begun. That road will be an eastern outlet for the West Virginia Central & Pittsburg, and will join the Pennsylvania, Western Maryland, and Baltimore & Ohio at Hagerstown. The distance from Cumberland via Hagerstown to Weverton on the main line of the Baltimore & Ohio is only three miles greater than over the Baltimore & Ohio lines exclusively, so there is no reason why freight received from the West Virginia Central & Pittsburg by the Baltimore & Ohio should not keep our tracks to Hagerstown." Speaking of the bonds of the Baltimore & Cumberland, Mr. Davis said: "They have have been endorsed by the West Virginia Central & Pittsburg. There have been a number of private applications for the bonds, but as yet none of them have been placed." Besides the guarantee of the West Virginia Central & Pittsburg, the Piedmont & Cumberland, agrees to retain five per cent. of all business transferred to it by the new road, or transferred by it to the new road, as a guarantee fund. The amount of bonds authorized is $3,600,000, but it is not intended to issue more than $3,000,000 until the road is completed. The West Virginia Central & Pittsburg interests agree to take $1,000,000 of these bonds, and $500,000 more have been subscribed for.

Wiscasset & Quebec.—It is reported that a syndicate of men, residing along the line of the railroad in Maine have agreed to take $100,000 of the $400,000 of bonds authorized by stockholders last week to complete the road to Burnham, Me., and to build a connection with the Canadian Pacific and Bangor & Aroostook roads. Another syndicate, it is said, will take $100,000 worth more. In the spring the work of track laying will be completed to Burnham. The grading to that point has been finished.

GENERAL RAILROAD NEWS.

Brooklyn Elevated.—The earnings for November are reported as follows:

	1894.	1893.	1892.
Gross earnings	$143,481	$148,215	$163,463
Oper. expenses	81,954	88,191	89,878
Net earnings	$ 62,527	$ 60,024	$ 73,585
Net 11 months	617,127	690,743	750,082

Chicago, St. Paul, Minneapolis & Omaha.—The Railroad Company has declared a semi-annual dividend of

3½ per cent. on its preferred stock. The company reports for the year ending Dec. 31:

	1894.	1893.	Inc. or Dec.
Gross earnings	$7,297,619	$8,328,928	D $1,031,309
Oper. exp. & taxes	4,946,184	5,843,532	D 897,348
Net earnings	$2,351,435	$2,485,396	D $133,961
Int. and rentals	1,521,436	1,520,319	I 1,117
Balance	$ 829,999	$ 965,077	D $ 135,078
Dividends	787,976	787,976	
Surplus	$ 42,023	$ 177,101	D $ 135,078

These figures do not include proceeds of land sales. The dividends have been: 1881 to 1885, 7 per cent.; 4¾ per cent. in 1885; 6 per cent. 1886 to 1889; 3 per cent. in 1889; 4 per cent. in 1890 and 1891; 6½ per cent. in 1892, and 7 per cent. in 1893 and 1894.

Chicago, Milwaukee & St. Paul.—The earnings of the Company for December and the year, are reported in the following table:

December:	1894.	1893.	1892.
Gross earnings	$2,203,523	$2,534,174	$3,291,618
Oper. expenses	1,302,275	1,674,733	1,961,219
Net earnings	$ 901,247	$ 859,440	$ 1,330,399
Prop. expense to gross	59⅛	66	59⅝
Twelve months:			
Gross earnings	$28,473,365	$33,860,022	$35,060,209
Oper. expenses	18,498,340	22,431,642	23,234,077
Net earnings	$9,975,025	$11,428,380	$11,826,132
P. c. to gross	64⅞	66¼	66⅛

Delaware, Lackawanna & Western.—The annual report for the year ending Dec. 31 gives the following figures:

	1894.	1893	1892.
Gross earn	$43,058,862	$48,790,973	$46,226,283
Oper. expen	36,009,195	40,537,572	37,781,880
Net earn	$7,049,667	$8,253,401	$8,444,402
Interest and rentals	5,412,322	5,360,489	5,366,406
Balance	$1,637,344	$2,892,912	$3,077,996
Betterments	....	....	464,539
Balance	$1,637,344	$2,892,912	$2,613,457
Dividends	1,834,000	1,834,000	1,834,000
Deficit	$196,666	S. $1,058,912	S. 779,457
Coal transported	7,822,476	9,529,883	9,327,446
On stock	6.24 p. c.	111.04 p. c.	9.98 p.c.

The gross earnings; in 1894, as compared with 1893, decreased, $5,732,111; operating expenses decreased, $4,528,377; net earnings decreased, $1,203,734; charges increased $51,833; balance decreased, $1,255,567; deficit increased $1,255,567, and the coal tonnage decreased 1,707,407 tons.

Georgia Southern & Florida.—A suit was instituted by Simon Danzig, of New York, last week, at Baltimore, in the Circuit Court, against the Reorganization Committee of the railroad and the Mercantile Trust & Deposit Co., of Baltimore. It is sought to withdraw the bonds from the Trust Company and to declare the pooling agreement null and void, and to restrain the Reorganization Committee from carrying out its proposed plan. It is a test case. The railroad is 285 miles long, and has been in the hands of a Receiver for two years.

Indiana, Illinois & Iowa.—McIntosh Brothers, of Milwaukee, railroad contractors, have filed a lien upon the Indiana, Illinois & Iowa Railroad Company for $99,000. They constructed the road from Knox to South Bend, Ind., 35 miles in 1894.

Lawrenceville.—It is announced that the operation of the Lawrenceville branch line, extending from Lawrenceville to Suwannee, Ga., ten miles, is to be resumed, a local company having been organized to operate it. The road has been abandoned for some time. It was formerly one of the Richmond & Danville lines. T. M. Peebles, at Lawrenceville, is President.

Mary Lee Coal & Railroad Co.—The Chancery Court at Birmingham, Ala., has ordered a foreclosure of the mortgage held by the Mercantile Trust & Deposit Co. on the properties of the Mary Lee Coal, Iron & Railroad Co. An order of sale is expected to follow. The trust company is trustee for $250,000 of the mortgage bonds. The Mary Lee Company operates large mines and coke ovens and a short railroad line near Birmingham.

Pennsylvania, Poughkeepsie & Boston.—Judge Dallas, in the United States Circuit Court at Philadelphia, has confirmed the recent sale under foreclosure of the property of the railroad. The property, which was sold for $350,000, was purchased by W. B. Scott, of Philadelphia, representing the first mortgage bondholders. The action was begun in New Jersey by the Holland Trust Company, of New York as trustee under the mortgage.

Philadelphia, Reading & New England.—Judge Dallas, in the United States Circuit Court, at Philadelphia, has confirmed the recent sale of the property of this railroad company. The purchaser is William B. Scott, and the amount realized is $350,000. The action was begun in New Jersey by the Holland Trust Co. as trustees, and as the defendant company had property in the Pennsylvania circuit, proceedings followed there.

Philadelphia & Reading.—Joseph F. Sinnott, a Director of the company, has sold 22,000 shares of the stock of the company held by him. Mr. Sinnott and his firm still hold 22,000 shares of Reading, of which Mr. Sinnott, personally, owns the majority. This block of 44,000 shares was the largest individual holding of stock, the next largest being the 33,000 shares held by Director Thomas McKean.

Philadelphia & Reading.—F. P. Olcott, Chairman of the Reorganization Committee, gives notice that the committee now holds $33,099,000 of general mortgage bonds under the bondholders' agreement of May 7, 1894. The committee has also received and holds under the terms of its announcement of Jan. 2, $12,182,300 of first preferred income bonds, $6,261,600 of second preferred income bonds, $8,631,400 of third preferred income bonds, $456,988 shares of stock, and $6,462,900 deferred income bonds.

Portland & Ogdensburg.—No bids having been received by the city of Portland, Me., for the Portland & Ogdensburg Railroad stock, which was offered for a minimum price of $50 a share, the city has now withdrawn the stock from the market. At present a temporary loan will be negotiated by the city to pay the maturing bonds, and later bonds will be issued for refunding this part of the city's debt.

Union Pacific.—Mr. Brice, from the Senate Committee of Pacific Railroads, has this week submitted a report upon the roads of that system, in which the refunding of the debt of the Union Pacific is recommended. As to the period for which the debt should be extended, and the rate of interest, the commiittee, for the present, make no special recommendation. They confine themselves generally to the matter of refunding the debt for such a period, and at such a rate as shall enable the company, under ordinary circumstances and business conditions, to meet the current interest, and a portion of the principal of the debt each year, so that at the expiration of the period for which the extension is granted the debt may be wiped out.

The statement of the company for November shows a gross decrease of $310,500, and, with an increase of $175,070 in operating expenses, a net loss of $485,571. The November, 1893, earnings showed a gross decrease of $962,129 and a net decrease of $371,436. The increased expenses came on the main line, $100,000, and on the Oregon Short Line & Utah Northern, $117,000. The full comparative statement follows:

UNION PACIFIC.

November.	1894.	1893	Inc. or Dec.
Gross earn	$1,327,952	$1,544,901	D $216,949
Oper. expen	969,737	869,603	I 100,333
Net earn	$358,215	$675,297	D $317,082
Since Jan. 1.			
Gross earn	$13,637,740	$16,077,459	D $2,439,718
Net earn	$ 4,340,293	$6,323,813	D $1,983,520

OREGON SHORT LINE & UTAH NORTHERN.

November.			
Gross earn	$469,037	$455,409	I $13,628
Net earn	$109,577	$213,086	D $103,508
Since Jan. 1.			
Gross earn	$4,659,505	$5,476,587	D $817,081
Net earn	$1,303,906	$2,166,244	D $862,338

GRAND TOTAL OF UNION PACIFIC SYSTEM.

November.			
Gross earn	$2,055,850	$2,366,351	D $310,500
Oper. expen	1,561,010	1,385,939	I 175,070
Net earn	$494,839	$980,411	D $485,571
Since Jan 1.			
Gross earn	$21,540,954	$25,785,211	D $4,244,257
Oper. expen	15,524,423	16,554,318	D 1,029,895
Net earn	$6,016,530	$9,230,892	D $3,214,362

Wiscasset & Quebec.—The stockholders of the railroad have voted to bond the road for $400,000, to build the line to Burnham, Me., and to a connection with the Bangor & Aroostook and Canadian Pacific companies. The issue of $300,000 in bonds voted last October was cancelled. This is a 2 ft. gage line, being built north of Wiscasset, on the Maine coast. The distance to Burnham is 55 miles.

TRAFFIC.

Traffic Notes.

The Northern Pacific now runs heated freight cars from St. Paul through to the Pacific Coast once a week. No extra charge is made for the heat.

The Baltimore & Ohio Southwestern, and the Illinois Central, have put on a fast freight train between Cincinnati and New Orleans, scheduled to run through in 59 hours.

Railroads now and then haul a little merchandise on their own account. The Chicago & Grand Trunk has lately shipped to its icehouses, from Vicksburg, Mich., 600 carloads of ice.

The Texas Car Service Association has discontinued its weighing bureau, which was established two months ago, chiefly for the purpose of weighing cotton. According to a Texas paper, the number of bales of cotton weighed, up to January 1, was 335,699, and the resulting increase of billed weights was 845,263 lbs., or less than 3 lbs. to the bale.

The Long Island Railroad is to reduce fares 20 to 30 per cent. between Long Island City and all stations out as far as Whitestone, and at the same time will largely increase the number of trains on this section of the road. A bill was before the State Legislature last winter, and is up again this session, to compel this road to reduce all its passenger fares to two cents a mile.

The New York Supreme Court has vacated the interim injunction obtained by the Delaware, Lackawanna & Western, restraining the New York, Susquehanna & Western from transporting coal, which the latter controlled, over any other road than the Lackawanna. The Lackawanna is suing for damages for breach of contract, and the action will be brought to trial in April.

Representatives of the principal railroads of the South Atlantic States met at Jacksonville, Fla., last week, to see about joining the Northern and Western roads in reducing the rate per mile for freight cars interchanged from 7½ mills to 6 mills. Another meeting will have to be held, as some important lines were not represented, but it is understood that the change will soon be agreed to.

Chicago Traffic Matters.

CHICAGO, Jan. 30, 1895.

The representatives of the freight departments of the trans-continental lines who have been in session for two months have adjourned to March 15. As was noted last week, they agreed to advance through rates from New York, Chicago and the Missouri River to California points to a basis of 50 cents per 100 lbs. In addition they agreed to raise the minimum carload from 20,000 to 22,000 lbs. When the question of rates from Pittsburgh, Buffalo, etc., came up, the Southern Pacific wanted these rates made by adding local rates to the through rates from Chicago. The Western roads at once objected to this as likely to cause a lower rate via New York than via Chicago; the Southern Pacific receded, and it was finally agreed that Atlantic seaboard rates should govern from all interior points on and east of the Missouri River on all rail traffic to the Pacific coast, subject to a minimum of 75 cents per 100 lbs., but not in excess of the lowest combination of locals.

The Chicago merchants and the railroads are still in conference regarding rates from Michigan, Indiana, etc., to interior points in Illinois. Several schedules and counter-propositions have been submitted by both sides, but as yet no basis has been reached on which both could agree.

Illinois Central and the Chicago & Eastern Illinois are indulging in a little scrimmage over soft coal rates from the Indiana and Illinois mines to Chicago. The Eastern Illinois made the first reduction from $1.10 to 80 cents on the ground that its competitors were getting all the business by some secret arrangement. The Illinois Central met this rate last week and the Eastern Illinois promptly made a further reduction to 65 cents.

The Grand Trunk does not propose to allow the Canadian Pacific to profit by its combination with the western roads without a fight for the business from competitive points in Canada, and it has got the Buffalo Committee to omit the differential Canadian Pacific rates from the Buffalo rate sheets. This will force the Canadan Pacific to issue its own tariffs from Eastern territory. The Western lines take the position that, while they would be very glad to assist the Grand Trunk, they are obliged to recognize the Canadian Pacific differental or allow that line to continue a free lance, which would defeat all the work that has been accomplished in the formation of the new committee.

Already there are straws flying which seem to indicate that trouble is brewing in the pass agreement, and some of the roads are exceedingly busy gathering evidence and "sharpening their knives" preparatory to filing charges against one prominent member.

Last week's eastbound shipments show another large increase. No apparent reason exists for this save that the lines are not maintaining agreed rates. It is current gossip that rates are being cut from 7 to 10 cents per 100 on grain and provisions. It is another matter to prove it, however.

The shipments of eastbound freight, not including live stock, from Chicago, by all the lines for the week ending Jan. 26 amounted to 54,963 tons, against 43,588 tons during the preceding week, an increase of 11,375 tons, and against 58,604 tons for the corresponding week last year. The proportions carried by each road were:

Roads.	Week to Jan. 26.		Week to Jan. 19.	
	Tons.	p. c.	Tons.	p. c.
Michigan Central	4,749	8.6	4,754	10.9
Wabash	4,930	9.0	3,782	8.7
Lake Shore & Mich. South.	4,282	7.8	4,653	10.7
Pitts., Ft. Wayne & Chicago.	10,988	20.0	4,920	11.3
Pitts., Cin., Chi. & St. Louis	5,978	10.8	4,939	11.4
Baltimore & Ohio	7,100	12.9	7,181	16.5
Chicago & Grand Trunk	2,890	5.4	2,359	5.4
New York, Chic & St. Louis	6,502	11.8	3,575	8.0
Chicago & Erie	5,789	10.5	5,523	12.7
C., C. C. & St. Louis	1,755	3.2	1,902	4.4
Totals	54,963	100.0	43,588	100.0

Of the above shipments 3,776 tons were flour, 22,567 tons grain and mill stuff, 11,807 tons cured meats, 8,739 tons dressed beef, 1,140 tons butter, 1,854 tons hides, and 3,808 tons lumber. The three Vanderbilt lines carried 28.2 per cent., the two Pennsylvania lines 30.8 per cent.

Western Trunk Line Passenger Committee.

The passenger representatives of the lines west of Chicago, who have been in practically continuous conference in that city since November 26 have adopted a new agreement, the main provisions of which are as follows:

The title of the association is to be The Western Trunk Line Passenger Committee.

The business included in the jurisdiction of the committee is stated to be all competitive passenger traffic originating on, destined to, or passing through eastern gateways to be established at Galveston, New Orleans, thence north along the line of the Mississippi River to and including St. Louis; the St. Louis-Chicago line of the Vandalia and Illinois Central, to and including Chicago; thence north along the western shore of Lake Michigan to and including St. Ignace; thence along the southern and eastern boundary of the line of the northern peninsula of Michigan to and including Sault Ste. Marie; thence along the southern and western shores of Lake Superior to and including Port Arthur, and in territory west of the above described line, excepting the business of the Illinois Central from points north of the Ohio river to points south thereof, and on and east of the Mississippi river.

Each member agrees to conduct the competitive business subject to the committee at the rates and commissions that may be from time to time agreed upon and to take no individual action relative to any alleged disturbances without the action of the Committee, except that in cases of emergency any member may meet outside competition by at once notifying the Chairman of the Committee of its intention, provided, that no deviation can be made from mileage ticket rates or rates of commission as against competition within or without the association unless first authorized by the chairman.

Three-fourths of the membership is to be a quorum and action taken at any meeting having a quorum shall be binding on all members, except that as regards any measure affecting revenue unanimous action of all interested lines is required.

The Chairman is to rule on all disagreements and in case of objection to his ruling the matter is to be arbitrated by three persons in the usual manner. If the Board of Arbitration fail to approve the proposed measure the line proposing it may put it in effect after giving 10 days' notice to the other members of the committee.

Local associations are to be formed at Chicago, St. Louis, Kansas City, Omaha, St. Paul, Minneapolis, Denver, Pueblo, San Francisco and Los Angeles, and at any other points as may be hereafter agreed upon.

The agreement is to continue subject to 30 days notice of withdrawal. It has been signed by the following lines: Atchison; Burlington; Burlington, Cedar Rapids & Northern; Northwestern; Milwaukee & St. Paul; Rock Island; Canadian Pacific; Great Northern; Illinois Central; Northern Pacific; Oregon Railway & Navigation; "Soo" Line; Duluth, South Shore & Atlantic; Southern Pacific; Texas & Pacific; Wisconsin Central.

It is expected that the Chicago, Great Western, Denver & Rio Grande Western, Wabash and Missouri Pacific will also become members. B. D. Caldwell, Ex-Chairman of the Western Passenger Association, has been unanimously chosen chairman of the Committee.

It will be noted that the Union Pacific has not signed the agreement. After repeated attempts to get the signature of this line, it was decided to go ahead without it. Just what the result of this course will be, remains to be seen, but the other lines appear confident that they can maintain the agreement without the assent of the Union Pacific. The trouble with that road appears to be the refusal of the other lines to quote rates to Puget Sound points on the Northern Pacific over the Union Pacific. The Northern Pacific became a member on the distinct understanding that the other roads would protect its territory against the Union Pacific. The Union Pacific appears to be occupying an inconsistent position in that it persistently refuses to let the other lines into Portland via Denver and Ogden and the Oregon Short Line, insisting that it shall have the long haul; and at the same time claiming the right to cut into territory which is exclusively the Northern Pacific's, and which can be reached only by passing over the Northern Pacific from Portland.

With the putting in effect of the new agreement round trip rates from the Missouri River to California points will be advanced (Feb. 15) from $80 to $90 and one-way westbound second class rates from $35 to $40. Rates to North Pacific Coast points are correspondingly advanced. One new route has been added to the list, viz.: going and returning via Barstow and the Atchison route. Under the agreement with the Atchison and Southern Pacific the side-ride to San Francisco and from Los Angles to San Diego is admitted to the sheet.

Eastbound Grain Rate Twenty Cents.

The Executive Committee of the Central Traffic Association voted on Monday last to reduce eastbound grain rates to the basis of 20 cents per 100 lbs., Chicago to New York. It is currently reported that nearly all the roads have for several weeks been manipulating the rates so that they have been practically as low or lower than the tariff now established. The resolution adopted on Monday also provides that general freight agents at Chicago, Peoria, Cincinnati, and other grain points shall meet every week to see that rates are maintained.